ENVIRONMENTAL ASSESSMENT

Terminal C Canopy, Connector, and Roadway Project

Boston Logan International Airport
East Boston, Massachusetts

PREPARED FOR

Massachusetts Port Authority

PREPARED BY

IN ASSOCIATION WITH

Stantec
Gensler
Fennick McCredie
PGAL
WSP
Arup
Caminiti Consulting

DATE December 2018

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December 6, 2018

This environmental assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.

R Doucett

Responsible FAA Official
Environmental Program Manager
FAA New England Region

December 6, 2018

Date

Boston-Logan International Airport
Terminal C and Roadway Project
Finding of No Significant Impact (FONSI)

FEDERAL FINDING

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed federal action is consistent with existing national policies and objectives as set forth in Section 101 of the National Environmental Policy Act (NEPA) and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 101(2) (c) of the NEPA.

APPROVED: R Doucette Date: 11/30/18

Richard P. Doucette
Manager, Environmental Programs

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Massachusetts Port Authority
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East Boston, MA 02128-2909
Telephone: 617-568-5000
www.massport.com

December 6, 2018

Mr. Richard Doucette
Federal Aviation Administration
New England Region
1200 District Avenue
Burlington, MA 01803

Re: Terminal C Canopy, Connector and Roadway Project Environmental Assessment/ Boston Logan International Airport

Dear Mr. Doucette,

On behalf of the Massachusetts Port Authority (Massport), I am pleased to submit the **Environmental Assessment (EA)** for the **Terminal C Canopy, Connector, and Roadway Project** in accordance with the National Environmental Policy Act (NEPA) regulations. This document follows the Federal Aviation Administration (FAA) requirements for preparation of an EA under NEPA.

Boston-Logan International Airport is currently one of the fastest growing major U.S. airports in terms of number of passengers. This reflects the Boston metropolitan area's status as an important national and international destination, a robust regional economy, and regional demographics favorable to air travel. Largely due to the attractiveness of Boston and the entire New England region, passenger levels continue to grow independent of facility improvements. In an effort to update airport facilities, Massport has continued to make improvements to meet demand. In addition to accommodating current and projected passenger growth, the airport facilities must also be responsive to changes in the airline industry, whether it be airline mergers, consolidation and new entrants, or changes to improve security, operational efficiencies and passenger convenience and minimize environmental impacts.

As part of this ongoing process, Massport is proposing to renovate and improve the Terminal C building, associated roadways, and curbside areas and canopy. The EA describes Massport's plan to improve Logan Airport's ability to efficiently accommodate current and future passenger volumes. The Project will bring Terminal C facilities up to date and to improve access, egress and pick-up/drop-off operations, would improve efficiency, security flexibility and connectivity at Terminal C, eliminate the existing congestion and safety issues with airport access, and enhance passenger experience at the curbside with better operations and amenities (including a new canopy and elevators).

All parties on the distribution list were sent a copy of the draft EA or notice of availability. The draft EA was also available for inspection at a number of local libraries (as shown on the EA distribution list) and on Massport's website. Massport published notice of the draft EA and the public meeting in local/community newspapers and on our website. To ensure sufficient opportunity for public review, Massport completed a 30-day public comment period for the draft EA from November 1, 2018 to November 30, 2018 and comments received were sent to your office. A public meeting was held at 6:30 PM in the Logan Airport Rental Car Center on November 13, 2018. This EA will also be posted on our website at http://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/.

Please contact me at (617) 568-3524 if you have any questions about this project.

Sincerely,

Massachusetts Port Authority

Stewart Dalzell, Deputy Director,
Environmental Planning and Permitting

cc: Distribution List (EA Chapter 6)
J. Barrera, E. Becker, F. Leo, S. Harris-Long, D. Doane, N. Joyce/Massport
L. Lesperence/FAA

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Acronyms

ADT	Average Daily Traffic
ALP	Airport Layout Plan
APM	Automated People Mover
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
dB	Decibel
dBA	A-weighted decibels
DFE	Design Flood Elevation
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
EDR	Environmental Data Report
EPA	U.S. Environmental Protection Agency
ESPR	Environmental Status and Planning Report
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GSE	Ground Surface Equipment
HOV	High-Occupancy Vehicle
kBtu	Thousand British Thermal Units
LEED®	Leadership in Energy and Environmental Design
LOS	Level of Service
MAP	Million Annual Passengers
MassDEP	Massachusetts Department of Environmental Protection
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MOVES	Motor Vehicle Emission Simulator
MMBtu	Million British Thermal Units
MWh	Megawatt Hours
MWRA	Massachusetts Water Resources Authority
NAAQS	National Ambient Air Quality Standards

NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NO_x	Nitrogen oxides
OHM	Oil and/or hazardous materials
O_3	Ozone
Pb	Lead
PCBs	Polychlorinated biphenyls
PM	Particulate Matter
RSIP	Residential Sound Insulation Program
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SWSA	Southwest Service Area
TAR	Terminal Area Road
TNC	Transportation Network Company
Tpy	Tons Per Year
TSA	Transportation Security Administration
QATAR	Quick Analysis Tool for Airport Roadways
VOC	Volatile Organic Compounds

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1

Project Overview and Purpose and Need

1.1 Introduction

Boston-Logan International Airport (Logan Airport or the Airport) is currently one of the fastest growing major U.S. airports in terms of number of passengers. This reflects the Boston metropolitan area's status as an important national and international destination, a robust regional economy, and regional demographics favorable to air travel. Largely due to the attractiveness of Boston and the entire New England region, passenger levels continue to grow independent of facility improvements. In an effort to update airport facilities, the Massachusetts Port Authority (Massport), the owner and operator of Logan Airport, has continued to make improvements to meet demand. In addition to accommodating current and projected passenger growth, the airport facilities must also be responsive to changes in the airline industry, whether it be airline mergers, consolidation and new entrants, or changes to improve security, operational efficiencies and passenger convenience, and minimize environmental impacts.

As part of this ongoing process, Massport is proposing to renovate and improve the Terminal C building, associated roadways, and curbside areas and canopy. The Terminal C Canopy, Connector, and Roadway Project (the Proposed Action/the Project) would improve Logan Airport's ability to efficiently accommodate current and future passenger volumes. The Project, necessary to bring Terminal C facilities up to date and to improve access, egress and pick-up/drop-off operations, would improve efficiency, security flexibility and connectivity at Terminal C, eliminate the existing congestion and safety issues with airport access, and enhance passenger experience at the curbside with better operations and amenities (including a new canopy and elevators).

The Project would respond to industry changes already in effect and would not change Logan Airport overall aircraft operations, fleet mix, passenger numbers, or ground transportation volumes. New construction would take place entirely within the footprint of existing buildings and/or previously-developed areas. Several aircraft parking locations would be adjusted and the associated hydrant fuel pits would be repositioned to accommodate the realigned aircraft positions. The existing Terminal C passenger curbs would be expanded and reorganized to improve pick-up and drop-off operations.

1.1.1 Logan Airport Overview

Logan Airport is the primary airport providing service for the New England region. Logan Airport operates within a larger network of New England regional airports that include Boston-Manchester Regional Airport (New Hampshire) and T.F. Green Airport (Rhode Island). For the most part, air service from these two regional

airports is focused on short haul and medium haul nonstop jet service to business and leisure destinations as well as to air carrier hubs to access longer haul options.

Logan Airport is an economic engine contributing many jobs and substantial economic activity to the Boston metropolitan area and the larger New England region. The Airport supports approximately 95,000 direct and indirect jobs and contributes over 13 billion dollars a year in total economic activity. [1] In 2017, Logan Airport was the 16th busiest commercial airport in the U.S. as ranked by aircraft operations and the 13th busiest in the U.S. ranked by number of passengers.[2]

As shown in **Figure 1-1**, Logan Airport is one of the most land-constrained airports in the nation and is surrounded by water on three sides. The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including 700 acres underwater in Boston Harbor. Logan Airport is close to downtown Boston and is accessible by public transit and a well-connected regional roadway system.

Logan Airport has four passenger terminals (Terminals A, B, C, and E), each with its own ticketing, baggage claim, and ground transportation facilities. The airfield comprises six runways, approximately 15 miles of taxiway, and approximately 240 acres of concrete and asphalt apron. Massport continues to evaluate and implement enhancements to Logan Airport's security, operational efficiency, and accessibility to and from the Boston metropolitan area, while carefully monitoring the environmental effects of Logan Airport's operation.

1.1.2 Terminal C Overview

Terminal C (**Figure 1-2**) is comprised of four piers (A, B, C and D). It opened in 1967 and has undergone major renovations in 1987, 2002, and 2005. In 2016, Massport completed the Terminal C to E connection, which offers a seamless post-security connection between the two terminals. Upon completion of that connection, the three former Terminal D gates were renumbered as Terminal C gates (now located within Pier A).

Terminal C currently serves jetBlue Airways, Aer Lingus, Alaska Airlines, Cape Air, Sun Country Airlines, and TAP Portugal. Public parking for Terminal C is provided primarily in the Central Parking Garage, connected to the terminal via a passenger bridge. Logan Airport's United Services Organizations Inc. (USO) lounge, offering amenities to members of the United States Armed Forces and their families, is located in the lower level of Terminal C. Terminal C also houses the Airport's chapel.

1.2 Regulatory Compliance

Approval of the Terminal C Canopy, Connector, and Roadway Project is subject to federal environmental regulations. The Federal Aviation Administration (FAA) has determined that the Project requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA), due to proposed changes to the Airport Layout Plan (ALP) that would result from the Proposed Project's implementation. This EA describes the Project, identifies alternatives considered, and documents the potential environmental effects associated with constructing and operating the proposed Terminal C Canopy, Connector, and Roadway Project.

The Project is not expected to result in significant adverse environmental impacts, such as increased vehicle traffic, noise, air emissions, or substantive land disturbance/impervious surface area. The Project is expected to

1 Massport and Inter*VISTAS*, 2015
2 USDOT Bureau of Transportation Statistics, Airport Snapshots, Accessed April 11, 2018.

yield operational, security and environmental benefits through roadway improvements, enhanced security and more efficient, Leadership in Energy and Design (LEED®) certified building spaces. The FAA has reviewed this EA and has issued a Finding of No Significant Impact (FONSI) for the Proposed Project.

The Project is not subject to the Massachusetts Environmental Policy Act (MEPA) since it does not meet the following review thresholds: expansion of an existing terminal at Logan Airport that exceeds 100,000 (net new) square feet, construction or alteration of external (outside the airport) roadways, or generation of 2,000 new average daily traffic (ADT).[3] The Project has, however, been disclosed in Massport's annual Logan Airport Environmental Data Report (EDR) filings with the MEPA Office.

Chapter 5, *Regulatory Compliance and Public/Agency Coordination* provides more details regarding anticipated federal and state permits for the Project, along with the status of the permits and other approvals.

1.3 Project Goals and Objectives

Massport strives to provide safe, secure, and convenient facilities and access for its users and tenants. The overall goals of the Project are to provide flexible and efficient facilities for the changing airline industry, to improve efficiency and connectivity at the terminal, to improve Airport access, and to enhance passenger experience at the curbside with adequate pick-up and drop-off space and upgraded amenities (including a new canopy and elevators). In 2017, Terminal C processed a record number of passengers in 2017 but with only one-half the required curb capacity. This deficiency is most noticeable on the Departures Level during the morning peak hour. Growth in Transportation Networks Companies (TNCs) such as Uber and Lyft are also contributing to increased curb needs. The limited available space at Terminal C creates further challenges with curbside management. The short weaving distance between Terminals B and C (on both levels) combined with the increases discussed above has hastened the need for improvements that can address both a surge in traffic volume and vehicle safety on the terminal area roadways.

The Project includes the following key elements (**Figure 1-3**). Each Project element listed below is a separate project and are independent of one another. These projects are being evaluated as a single project due to their proximity within the Airport boundary, proximity to one another, and expected construction sequencing. Cumulative impacts can be captured appropriately in c considering these elements together. Refer to **Figure 1-4** for the location of the Project elements within the Airport footprint. Chapter 2, *Alternatives and Proposed Action,* provides a more detailed description of the proposed renovations and improvements.

3 Massachusetts Environmental Policy Act,11.03: Review Thresholds 6 (b)6.

\\vhb\proj\Wat-EV\14055.00FM-MPA\graphics\FIGURES\Chapter_1_figures090718.indd

FIGURE 1-1 Logan Airport Physical Setting

Terminal C Canopy, Connector, and Roadway Project

Source: Nearmap Color Ortho Imagery (08/26/2017)

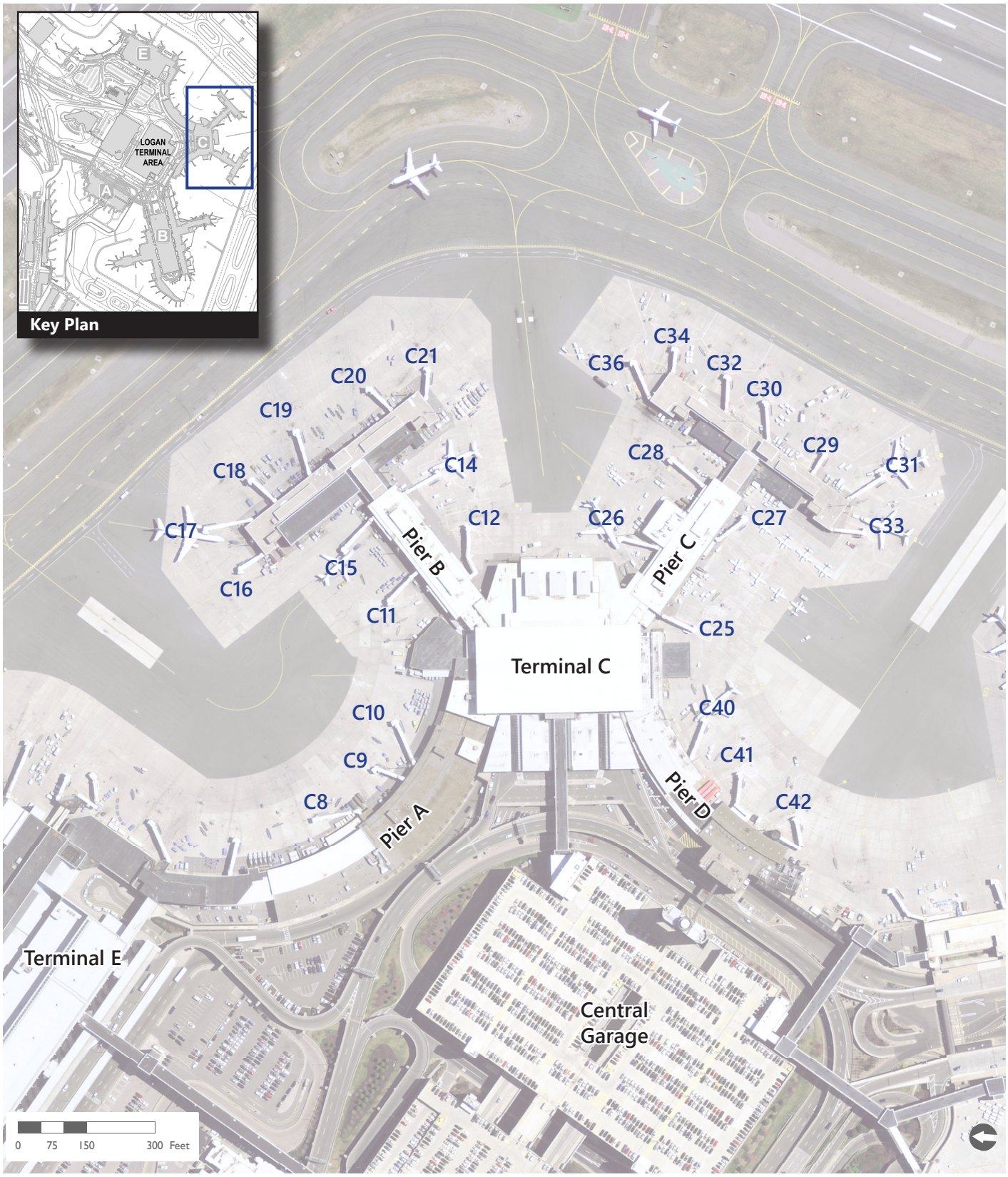

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FIGURE 1-2 Terminal C Existing Conditions

Terminal C Canopy, Connector, and Roadway Project

1.3.1 Terminal C Optimization and Terminal C to B Connector

The objective of the Terminal C Optimization and C to B Connector element of the Project is to improve existing connectivity and optimization deficiencies within Terminal C and between Terminals C and B. This would enhance the passenger experience, improve efficiency, functionality, and connectivity for passengers, tenants, and Airport operators.

The Project is designed to be consistent with the terminal and gate design criteria contained in the FAA *Airport Design Advisory Circular*.[4] The Project would incorporate sustainable design and construction practices and strives to achieve Leadership in Energy and Environmental Design (LEED®) Commercial Interiors Gold certification.

1.3.2 Terminal B to C Roadways Improvements

The objective of the Terminal B to C Roadways Improvements element of the Project is to improve traffic flow along the Terminal Area Roadways between Terminal B and Terminal C (both levels), improve traffic safety, and reduce roadway back-ups into the terminals and replace deteriorating roadway infrastructure.

1.3.3 Terminal C Canopy and Curbside Improvements

The objective of the Project is to improve passenger experience at the curbside. This would be done by replacing the existing canopy with a structure that provides more daylight and weather protection at the curb, increasing vertical circulation (elevators) to improve access between the Terminal and Central Parking Garage, and increasing curbside areas to accommodate better pick-up/drop-off access and operations.

4 United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13A, Airport Design,* September 28, 2012.

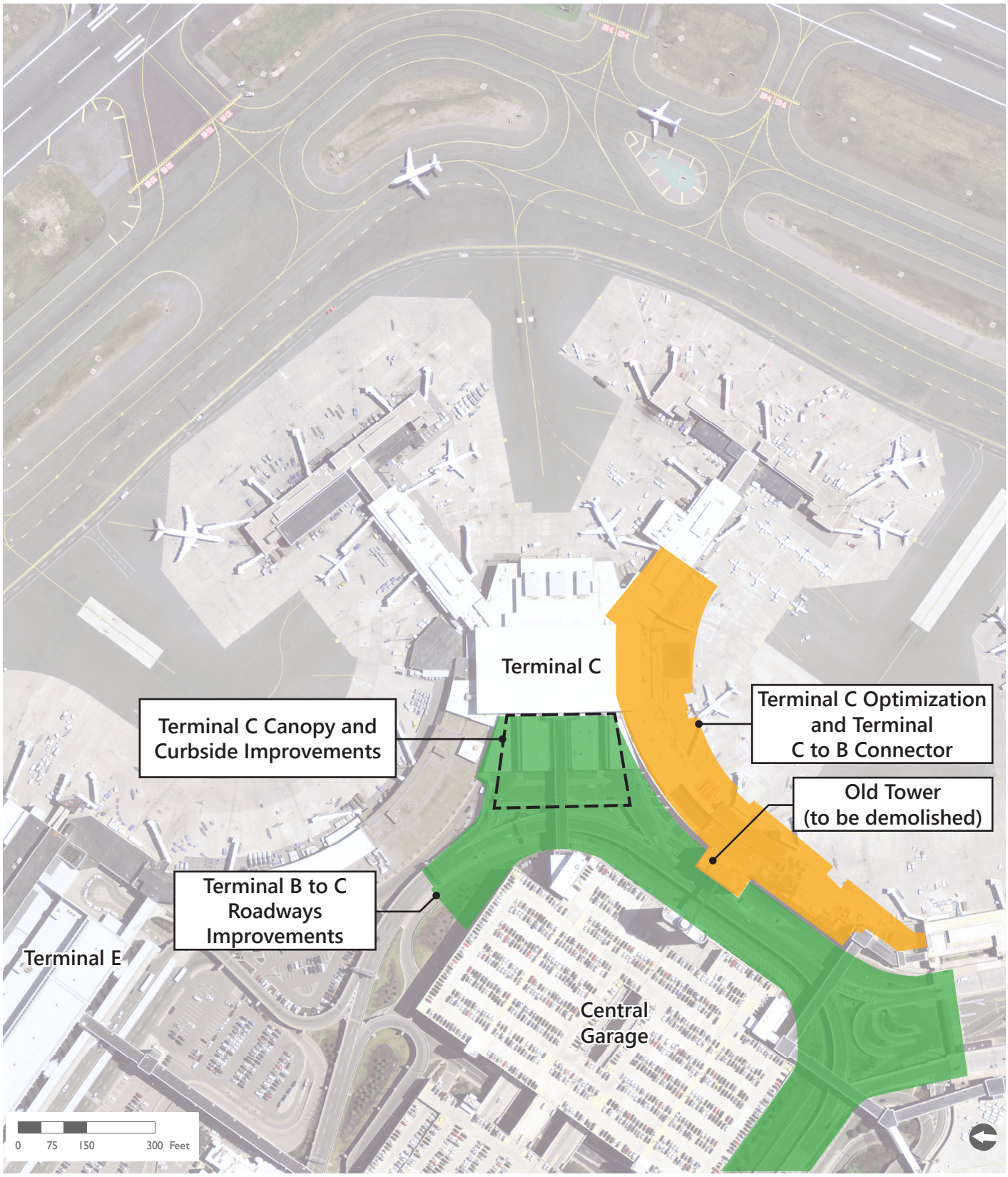

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FIGURE 1-3 Proposed Action Approximate Limits of Work

Terminal C Canopy, Connector, and Roadway Project

massport

Source: FMA, Stantec, Gensler

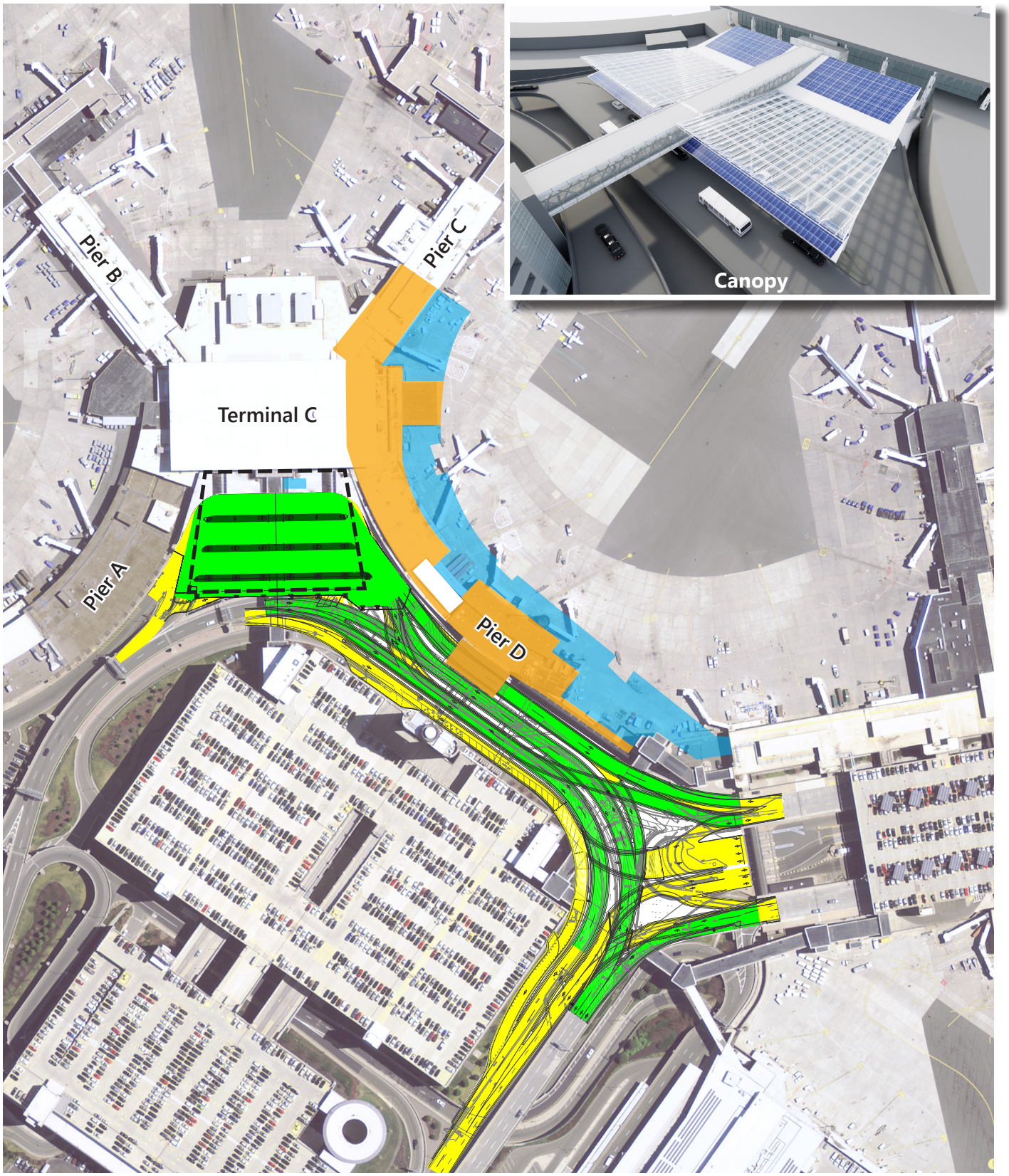

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FIGURE 1-4 Proposed Action

Terminal C Canopy, Connector, and Roadway Project

Arrivals Roadways
Departures Roadways
New Construction
Renovation
Canopy

massport

Source: FMA, Gensler, Stantec

1.4 Proposed Project

The Terminal C Canopy, Connector, and Roadway Project is proposed to include the following:

- Terminal C Optimization and Terminal C to B Connector:
  - Consolidate security checkpoint operations, improving safety, throughput, and customer experience
  - Connect all Terminal C gates post security (airside) to avoid requiring passengers to leave and reenter the secured area when connecting flights
  - Connect all Terminal B and C gates, allowing for greater gate flexibility and enhanced passenger connectivity
  - Renovate non-public and public spaces both pre- and post-security to improve functional efficiency
  - Enhance passenger holdrooms to accommodate existing and anticipated passenger areas activity levels
  - Improve passenger amenities to enhance the passenger experience.
  - Construct new consolidated office space to replace existing space located in Old Tower and demolish the Old Tower building
  - Optimize gate layout by relocating fuel pits, right-sizing ramp positions, and providing one additional jetbridge
- Terminal B to C Roadways Improvements
  - Reconstruct terminal area roadway network between Terminals B and C, including entrances and exits to both terminals
  - Eliminate weave between terminals on both levels while maintaining all major traffic movements
- Terminal C Canopy and Curbside Improvements
  - Replace existing canopy with expanded architectural gateway
  - Expand departures and arrivals level curbsides
  - Update and improve passenger wayfinding
  - Provide new elevators to improve vertical passenger circulation within the terminal and to/from the Central Parking Garage

The Project includes renovation, replacement, and new construction. It will include the renovation of approximately 136,000 square feet of existing public space and the construction of an additional new public space within and between the terminals and the addition of approximately 73,000 square feet of net new building space. The Proposed Project would also accommodate most of the existing 30,000 square feet of office

space currently located in the Old Air Traffic Control Tower (Old Tower), allowing for the demolition of the Old Tower building expected to be complete by summer 2020.

1.5 Purpose of the Project

The overall purpose of the Project is to:

- Improve terminal operational flexibility and efficiency for the airlines and Massport;
- Improve passenger connectivity between terminals;
- Enhance terminal roadways operations and safety;
- Expand passenger pick-up and drop-off areas;
- Improve efficiency of passenger screenings by the Transportation Security Administration;
- Enhance passenger service and convenience; and
- Improve lighting and wayfinding signage.

The Project includes the following three key elements:

- Terminal C Optimization, and Terminal C to B Connector;
- Terminal B to C Roadways Improvements; and
- Terminal C Canopy and Curbside Improvements.

Refer to **Figure 1-3** for the location of the Project elements within the Airport footprint. Chapter 2, *Alternatives and Proposed Action,* provides a more detailed description of the proposed renovations and improvements.

1.6 Airline Industry Trends

The airline industry continues to evolve with consolidations, new entrants, and different service models. Massport strives to provide terminal and landside facilities that are flexible enough to accommodate these changes. This flexibility is also needed to facilitate shifts in airline locations and gate positions that respond to industry changes. The following section describes the historical terminal development of Logan Airport as a context for understanding the current and future changes in the airline industry to which all airports must respond.

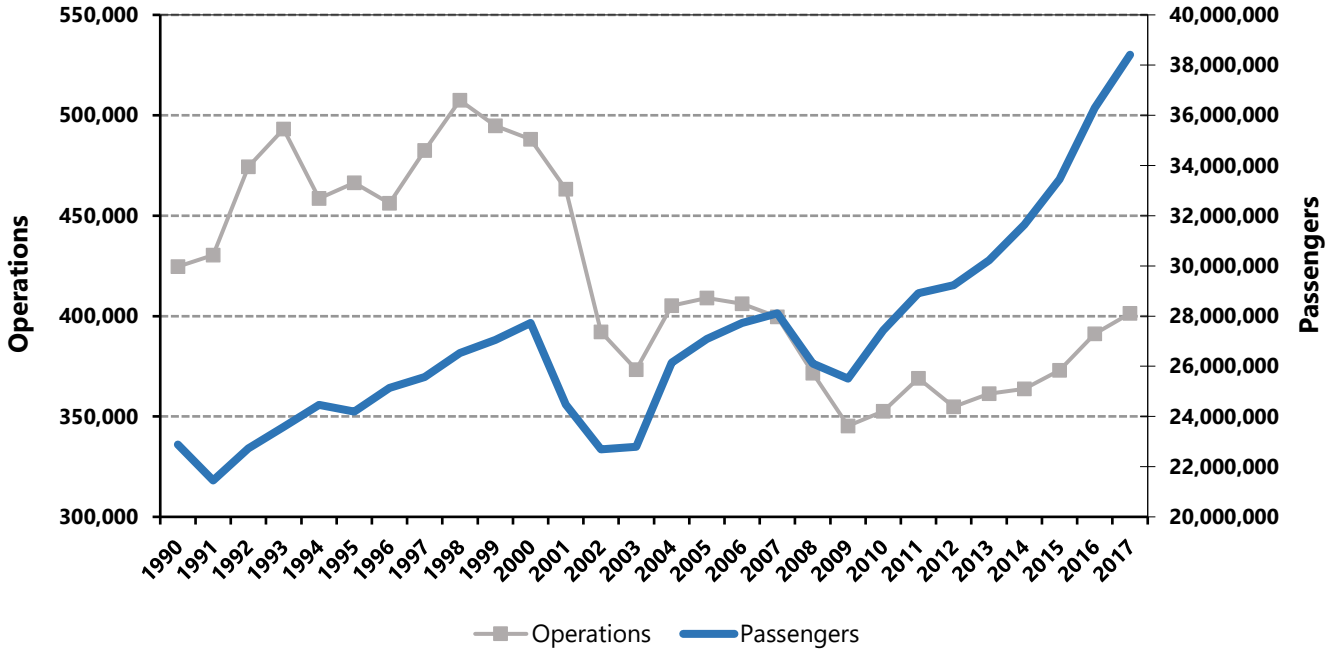
1.6.1 Passengers and Operation Activity Levels

For over three decades, Massport has tracked and reported on historical, Airport-wide passenger and aircraft operation activity levels in the annual Logan Airport EDRs and Environmental Status and Planning Reports (ESPRs). The EDRs and ESPRs present the cumulative context for assessing the impact(s) of passengers and aircraft operations on ground access, noise, and air quality conditions at the Airport. In addition, Massport plans for future airport activities by developing passenger and operations forecasts. Massport assesses terminal-specific conditions for internal planning purposes to ensure that the Airport and its facilities are functioning efficiently and effectively. The following section describes the historical passenger and operations at Logan Airport in general and at Terminal C specifically. It also describes the configuration and use of aircraft gates.

1.6.2 Airport Passenger and Operations Activity Levels

The *2016 EDR* reports on annual activity at Logan Airport in 2016, including air passengers, aircraft operations, aircraft fleet mix, and cargo volumes compared to 2015 levels.[5] Logan Airport is an important origin and destination (O&D)[6] airport both nationally and internationally and is one of the fastest growing major U.S. airports, in terms of number of passengers, over the past five years.[7] In 2017, passenger activity levels reached an all-time high of 38.4 million passengers and aircraft operations totaled 401,371. From 2000 to 2017, the annual number of passengers at Logan Airport increased by 38.5 percent, while the annual number of aircraft operations[8] decreased by 21.6 percent. Despite the increase in passengers, aircraft operations at Logan Airport remained well below the 487,996 operations in 2000 and the historical peak of 507,449 operations achieved in 1998. Logan Airport's market demand and passenger levels are a result of the Boston metropolitan area's status as an important national and international destination, a robust regional economy, and regional demographics favorable to air travel. **Figure 1-5** illustrates historical air passenger and aircraft operation activity levels at Logan Airport from 1990 through 2017.

Figure 1-5 Logan Airport Historical Air Passenger and Aircraft Operations, 1990-2017



Source: Massport.

5 Massachusetts Port Authority, 2016 Environmental Data Report (EDR) Boston-Logan International Airport. May 2018. http://massport.com/massport/about-massport/project-environmental-filings/logan-airport/

6 "Origin and destination" traffic refers to the passenger traffic that either originates or ends at a particular airport or market. A strong O&D market like Boston generates significant local passenger demand, with many passengers starting their journey and ending their journey in that market. O&D traffic is distinct from connecting traffic, which refers to the passenger traffic that does not originate or end at the airport but merely connects through the airport en route to another destination.

7 Between 2010 and 2016, Logan Airport was the 8th fastest growing airport in the U.S. in terms of domestic O&D traffic (U.S. DOT O&D Survey).

8 An aircraft operation is defined as one arrival or one departure.

1.6.3 Terminal C Passenger and Operations Activity Levels

Passenger activity levels at Terminal C experienced robust growth in 2016 and 2017, fueled by increased service provide by jetBlue Airways (primary air carrier at Terminal C). In 2016, the number of total passengers using Terminal C increased by 15.61 percent over the prior year to 5.7 million. Terminal C traffic accounted for 30.4 percent of total Logan Airport passengers in 2016. While Terminal C mostly served the domestic market, international passengers accounted for 11.4 percent of total passengers at Terminal C.

Total scheduled operations at Terminal C increased by 7.5 percent in 2016, with 134,056 annual (passenger) aircraft operations. Terminal C was the most active terminal at Logan Airport with approximately 34.3 percent of all operations. International operations accounted for six percent of total Terminal C operations.

JetBlue continued to increase operations from Logan Airport with an average of over 120 daily departures in 2016. New domestic destinations introduced in 2016 included Nashville, New York LaGuardia, and Salt Lake City. JetBlue also added frequencies in markets including Fort Lauderdale, Fort Myers, and Tampa. As Logan Airport's largest carrier, jetBlue accounted for 26.8 percent of total domestic passengers and 27.8 percent of total domestic passenger aircraft operations in 2016.

1.6.4 Airport-wide Forecast and Operations Activity Levels

As part of ongoing planning, Massport prepares passenger, operations and cargo activity forecasts. Demand for passenger service is determined by many external factors including economic growth, cost of travel, and demographic shifts.

Logan Airport's passenger traffic reached a peak in 2017 with 38.4 million passengers. This followed unprecedented but consistent growth since 2010, making Logan Airport one of the fastest growing airports in the U.S. Regional and national growth as well and changes in airline strategy have combined to produce the record breaking traffic growth and will continue to contribute to the expected short-term growth at Logan Airport:

- JetBlue Airways' strategy of forging relationships with the foreign flag carriers to facilitate increased connections from jetBlue's Boston network. Markets such as Detroit and Raleigh/Durham connect an increasingly significant number of passengers through Boston onto a diverse group of foreign flag airlines.
- Continued growth by jetBlue Airways and Delta Air Lines. Both carriers have indicated they will increase the number of annual departures 10 percent per year until they reach 200 and 125 daily departures respectively. Southwest Airlines is also expected to expand services.

For the purposes of this EA, a passenger forecast for 46.5 million air passengers was used, roughly representing a 2030 design year. This forecast is consistent with FAA's Terminal Area Forecast (TAF). FAA's 2017 TAF predicts that the annual passengers using Logan Airport in 2024 would be 46.9 million and up to 54.1 million in 2030.

1.7 Project Need

Massport must continue to provide flexible and convenient facilities for its tenants and users. Based on an understanding of the changing airline industry and specific terminal and roadway configurations at Logan

Airport, the following section describes the need for the Proposed Action. The Terminal C Canopy, Connector, and Roadway Project responds to the need to improve efficiency, flexibility, and connectivity at Terminal C, to improve traffic congestion and safety at the terminal area roadways and to improve curbside drop-off/pick-up operations as well as enhance passenger terminal access experience.

1.7.1 Need for the Terminal C Optimization and C to B Connector

Since the completion of the Logan Modernization Program in 2005, Logan Airport has continued to experience strong growth, providing mounting pressure on terminal facilities that were designed and constructed to operate under a now-outdated airline operational model. As the Airport has moved into the 21st century, airline industry changes have demonstrated the need for a seamless post-security facility.

Terminal C has not kept pace with the most current industry standards for new terminal design and sizing, nor passenger experience. Terminal facilities need to be brought up-to-date, specifically with improvements to the security checkpoint, concessions and holdrooms. Currently, there is no post-security connectivity within Terminal C between Gates C40, C42 and the rest of Terminal C and no post-security connection between Terminals C and B. The existing pre-security pedestrian connection also needs to be improved and upgraded.

Since the new Air Traffic Control Tower was constructed in 1973, the Old Tower has been converted to office space, though it is inefficiently arranged and inconvenient. The Old Tower is no longer needed for its original air traffic control purposes and its central location takes up valuable roadway/curb space in a constricted area of the airport roadway system.

The existing layout of the gates in Pier D of Terminal C is not ideally configured for the current aircraft fleet mix and passenger waiting areas.

1.7.2 Need for the Terminal B to C Roadways Improvements

The Terminal Area Roadways connecting Terminal B and Terminal C currently are characterized by high levels of traffic congestion on both the arrivals and departure levels roadways, particularly at peak early morning and late afternoon departure times. These issues result from short queuing space due the proximity of Terminal B to Terminal C, as well as insufficient curbside pick-up/drop-off areas at Terminal C, often resulting in traffic accessing Terminal C departures backing up along the terminal area roadway blocking vehicles existing the Terminal B curb and Terminal B parking garage. Poor operating conditions along the Terminal Area Roads are exacerbated by insufficient weaving distances between the Terminal B exits and the Terminal C entrances (both levels), causing traffic safety concerns. During peak periods, the congested roadway segments also experience higher vehicle emissions than would result from a more efficient roadway layout.

In addition to the traffic issues, the existing departures level viaduct, from the Terminal B entrance to the Terminal C exit is approaching the end of its function life. This viaduct is in need of a constant maintenance and repair, which will continue until replaced.

1.7.3 Need for the Terminal C Canopy and Curbside Improvements

The existing Terminal C canopy is a heavy, opaque canopy that cuts off light to Terminal C and its curbside. It does not cover the departures level curbside entirely and is experiencing significant waterproofing and leakage issues. As mentioned in Section 1.7.2, the existing Terminal C curbside also does not provide sufficient length to accommodate normal daily vehicle operations, particularly at the departures level. The two existing elevators are currently difficult

to find given the poor visual connection between the elevators and the terminal. Additionally, the existing elevators do not provide sufficient passenger capacity to adequately accommodate passenger movement between the Terminal and Central Parking Garage, particularly during the construction phase.

1.8 Public Involvement

Public outreach and community input is an important element of Massport's overall environmental review processes. Community and agency outreach and coordination will continue through permitting, design, and construction of the Project.

Massport described the Proposed Project in the publicly-circulated *2016 EDR*, published in May 2018.[9] Massport posts information about key regulatory filings on its website and the Draft EA was first made available on October 31, 2018. The EA and all supporting documentation can be found along with Massport's most recent environmental filings, at http://www.massport.com/massport/about-massport/project-environmental-filings.

While an EA public meeting is not mandatory as part of the NEPA process, at FAA's request, an informational meeting on the Draft EA was hosted by Massport during the 30-day NEPA public comment period which ran from November 1 to November 30, 2018. The public meeting was held on November 13, 2018 at 6:30 PM in the Cathy Leonard MacLean Community Room at the Logan Rental Car Center.

Public notices of EA availability and the meeting were published in the Boston Herald on November 2, 2018. English and Spanish notices were also published in the East Boston Times on November 7, 2018. Regulatory agencies, organized community groups interested in airport activity, and local residents were notified of the meeting either as part of the Draft EA cover letter or Notice of Availability. The goal of the meeting was to acquaint reviewers and the community with the Project, including construction schedule/activities, and to solicit input regarding project issues.

At the conclusion of the public comment period, FAA and Massport received two written comment letters. Copies of the comments letters are included in Appendix D of this EA.

9 Massport. 2018. *Boston-Logan International Airport 2016 Environmental Data Report*. May 15, 2018. http://www.massport.com/massport/about-massport/project-environmental-filings/. Accessed May 24, 2018.

2 Alternatives and Proposed Actions

2.1 Introduction

This chapter describes the process undertaken by the Massachusetts Port Authority (Massport) to identify reasonable and feasible alternatives for the Terminal C Canopy, Connector, and Roadway Project (the Proposed Action/the Project). This Environmental Assessment (EA), evaluates both the No-Action and Proposed Action with each of its elements combined. Alternatives are considered according to their ability to meet the Projects' purpose and need, (see Chapter 1, *Project Overview and Purpose and Need*) and other factors.

As discussed in Chapter 1, *Project Overview and Purpose and Need*, the purpose of the Terminal C Canopy, Connector, and Roadway Project elements is to:

- Improve terminal operational flexibility and efficiency for the airlines and Massport;
- Improve passenger connectivity between terminals;
- Enhance terminal roadways operations and safety;
- Expand passenger pick-up and drop-off areas;
- Improve efficiency of passenger screenings by the Transportation Security Administration (TSA);
- Enhance passenger service and convenience; and
- Improve lighting and wayfinding signage.

The Project includes three key elements; (1) Terminal C Optimization and C to B Connector (terminal improvements), (2) Terminal B to C Roadways improvements, and (3) Terminal C Canopy and Curbside improvements. A separate alternatives analyses were completed for each of these elements.

2.2 Planning Guidelines, Facility Requirements, and Design Assumptions

The following sections discuss the planning guidelines, facility requirements, and design assumptions that guided the alternatives development for the Project. The alternatives reflect design, sizing, and specifications guidance from the Federal Aviation Administration (FAA), Transportation Security Administration, and

Department of Homeland Security. Massport also considered aviation industry standards, Massport's internal requirements, airline needs, and Project-specific parameters during the development of the alternatives.

2.2.1 Planning Guidelines

Terminal facility and roadway capacity requirements at Terminal C were developed based on projected passenger activity for the airlines in Terminal C. Project construction is anticipated to be complete prior to 2024. This EA considers a design year of 2030 with a projected passenger demand of 46.5 million air passengers by that time.

Future passenger forecasts were developed based on existing peak summer (August 2017) flight schedules (see Chapter 1, *Project Overview and Purpose and Need*). These forecast passenger activity levels form the basis for developing terminal, roadway and curbside physical requirements. Each of the alternatives described accommodates the program requirements, but with different configurations and levels of efficiency.

2.2.1.1 Sustainability Standards and Guidelines

Massport is committed to operate its facilities in an environmentally sound and responsible manner. Massport's first Sustainability Management Plan for Logan Airport was published in 2015.[1] The plan sets specific goals for each area and identifies specific short-term initiatives to assist Massport in achieving these goals. The 2018 Sustainable Massport report is available on the Massport website at http://www.massport.com/media/2774/massport-annual-sustainability-and-resiliency-report-2018_lr.pdf. Massport has also incorporated U.S. Green Building Council Leadership in Energy and Environmental Design (LEED®) building goals in all new development and redevelopment projects at the airport for the past several years. Additionally, Massport has developed a Massport Floodproofing Design Guide[2] to address resiliency issues; particularly flooding hazards caused by extreme storms and rising sea levels. These plans and goals were considered in the development of alternatives.

2.2.2 Facility Requirements

The following sections discuss the facility requirements on which the Project design is based to accommodate airline growth and ongoing changes at Logan Airport.

2.2.2.1 Passenger Terminal Facility Requirements

Terminal space programming was undertaken to establish gross size requirements for various functional components of the Terminal C facilities necessary for to accommodate current and future Airport operations. While specific terminal facility requirements have not yet been finalized, the conceptual layouts considered to date have been based on a set of requirements sufficient to assess alternatives for potential environmental impacts. Furthermore, since the entire Project Area is already fully developed for aviation uses, variability in the site plan is unlikely to have a significant change in environmental impacts of beneficial measures.

Over the past several decades, specific planning guidelines have evolved within the airline planning industry and FAA that define various terminal functions. Airlines have developed their own specific planning metrics based on their business models and equipment needs and Massport adopted its own guidelines, included in its

1 Boston-Logan International Airport Sustainability Management Plan, April 22, 2018.
2 Massachusetts Port Authority Floodproofing Design Guide, November 2014, Revised April 2015.

Instruction Manual for Consultants,[3] to guide future terminal design and improvements. These guidelines, in conjunction with standard industry practices and airline standards, have directed terminal planning at Logan Airport since their adoption. **Table 2-1** compares industry standard aircraft gate and passenger terminal area facility program requirements with current conditions in Terminal C. These enhancements are needed to address current deficiencies as well as meet the needs for future anticipated aircraft operations and passenger handling.

Table 2-1 Terminal C Optimization and C to B Connector Space Program Facility Requirements[1]

Building Use	Existing	Required
Aircraft Gates[2]	4 gates	5 gates
Passenger Holdrooms	6,200	16,200
Checkpoint	19,080	12,580
Public Concourse	13,600	27,500
Restrooms	2,800	4,300
Retail/concessions	11,600	28,900
Passenger Amenities[3]	0	5,600
Building Systems	11,800	17,900
Non-public Space	13,300	22,191
Office Space[4]	30,000	30,000
Other[5]	64,300	80,416
	172,680	***245,587***
Net new required		**72,907**

Source: Massport; FMA
1 Based on industry standards.
2 Only includes gates within Project Area of scope
3 Passenger amenities include electrical charging stations, info bars, service animal relief areas, art opportunities, etc.
4 Office space under Existing scenario is located in the Old Tower
5 Other includes baggage claim areas, circulation (other than concourse), egress stairs, elevators, etc.

In addition to passenger requirements, Massport has non-public space requirements within the terminal areas to provide office and meeting space for Massport, FAA, Air Traffic Control, the U.S. Government, and other Airport stakeholders. Facility requirements related to this space are included as part of the Project in an effort to replace outdated and inefficiently laid out space in the Old Tower.

2.2.2.2 Gate Requirements

Massport continues to work on its Airport-wide program to connect gates post-security. For current conditions, gate requirements are based on proposed airline relocations and a plan to connect gates C40 through C42 to the other existing Terminal C gates. For future conditions, it is assumed that more passengers will be handled by adding flights in off-peak times and/or with larger aircraft. Gate requirements for all airlines in the Project Area were considered to identify total gate requirements. Based on evaluation of the gate requirements for the

3 Massport Capital Improvements, Massport website accessed 3/23/2018.

anticipated aircraft fleet mix, level of operations, and projected number of passengers the Terminals C to B Connector will require eight aircraft appropriate gates including seven gates that would be modified and one new gate that would be constructed. The new gate would accommodate aircraft currently parking on the apron between Terminals B and C due to the unavailability of a formal gate.

Alternate layouts for seven reconfigured gates (including two existing gates at Terminal B (B37/B38), and four existing plus one new gate at the Terminal C to B connector) were explored and options for the location of the new gate were studied. To determine aircraft gate allocation and parking positions (gate programming), the alternatives analysis considered the future expected aircraft mix and total number of aircraft that will be required to be serviced concurrently. The following assumptions were used for all Project alternatives:

- The aircraft fleet mix would remain the same as existing; the gates would accommodate primarily Aircraft Design Group III operations. Although not expected, if these gates are utilized by larger aircraft, it may be necessary to take an adjacent gate during the use to maintain wingtip clearance.
- To accommodate one additional gate within the C to B Connector footprint which would support aircraft currently parking on the apron, the existing gate locations would be repositioned.
- All ground service equipment (GSE) would be electric and included for each specific plane.

In addition to analyzing aircraft parking positions adjacent to the terminal, the aircraft parking positions were evaluated in relation to the various FAA surfaces including TERPS Surfaces[4] and Part 77 Imaginary Surfaces to determine if any aircraft components, specifically the tail height, penetrated these surfaces.

2.2.2.3 Security Checkpoint Requirements

Passenger security screening checkpoint requirements were determined based on the projected passenger peaks, and a mix of Pre-Check passengers, premium/first class passengers, and non-Pre-Check passengers (based on national data provided by TSA). A key element for sizing checkpoints is the provision of adequate queue space, passenger space for placing bags and belongings on conveyor (divesture space), and space for gathering bags and belongings after screening (recomposure space). The new security checkpoint will be designed in accordance with the TSA Checkpoint Design Guide.[5] Currently, the main Terminal C checkpoint contains two automatic screening lanes and eight standard lanes. The security checkpoint would remain in the existing main terminal checkpoint location, and it would provide seven automatic screening lanes and five standard lanes.

2.2.2.4 Passenger Holdrooms Requirements

Holdrooms are typically sized to accommodate passengers being served at each gate, considering the aircraft type, an 85 percent aircraft load factor (number of occupied seats), and providing seats for approximately 70 percent of the waiting passengers, per Logan Airport standards. (Other passengers are assumed to be elsewhere, such as visiting concessions areas, restrooms, or standing.) The holdroom seating would then configured to be efficient, consisting of a variety of seating options including Massport standard passenger

4 The Terminal Instrument Procedures (TERPS) document specifies the minimum measure of obstacle clearance that is considered by the FAA to supply a satisfactory level of vertical protection.

5 Checkpoint Design Guide (CDG), Revision 6.1. Prepared by Lockheed Martin System Integration Team for the Transportation Security Administration (TSA). June 01, 2016.

holdroom row seating with convenience outlets; lounge seating with side tables in lounge groupings; extended work table high seating with outlets and Wi-Fi; and groupings of tables with chairs.

2.2.2.5 Concessions and Retail Facilities Requirements

Concessions and retail facilities are sized considering the number of passengers using the terminal, combined with industry standards for passenger demand for types of facilities including food service, convenience retail, specialty retail, and where applicable, Duty-Free offerings. Representative spending patterns are used to develop economically supportable space requirements.

2.2.2.6 Airside Requirements

During development of Project alternatives, the airside requirements to accommodate Aircraft Design Group (ADG) III aircraft were determined both for taxiing and parking at the gates as they are the dominant aircraft using these gates and the types of aircraft utilized by airlines to service specific destinations.

Since Logan Airport currently utilizes an aircraft hydrant fueling system that provides Jet-A fuel to most aircraft parking gates, the configuration of the Airport-wide fuel hydrant system was also evaluated. Based on the location of the existing hydrants versus the proposed aircraft parking positions, it appears that five fuel pits will need to be repositioned.

2.2.3 Roadways Requirements

Massport recently evaluated options for the Terminal B and C roadways to replace aging infrastructure and enhance safety and to improve roadway traffic conditions (particularly relating to reducing terminal area congestion and delay) also improving safety associated with weaving conditions between traffic exiting Terminal B and those entering Terminal C. As part of this study, requirements for the development of the roadways were identified and defined by two key categories: operational constraints and design constraints/parameters. Operational constraints are those restrictions caused by active Airport roadway operations management including multimodal traffic movements to, from and between terminals. Design constraints are the minimum design requirements to maintain or improve current and future airport roadway operations performance and safety.

2.2.3.1 Roadways Operational Requirements

To ensure adequate and efficient operations on the Airport roadways, Massport identified a number of operational requirements that needed to be considered. These requirements were considered for all Project alternatives, including all temporary/enabling construction phases. The requirements include maintaining:

- Ingress to and egress from all Terminals.
- Ingress to and egress from Terminal B, Terminal B Garage and Central Parking Garages.
- Ingress to and egress from the Tower Lot (located in the eastern portion of the Central Parking Garage).
- Direct bus and HOV access from Terminal B to Terminal C.
- Passenger curbside pickup and drop-off service for all Terminals for all modes of travel (passenger cars, taxis, limousines, HOV, Transportation Network Companies (TNC), and buses).

2.2.3.2 Roadways Design Requirements

To determine roadway alignments and configurations, the alternatives analysis considered the current and future anticipated passenger demand along with existing constraints including horizontal and vertical obstructions, clearances, sight distances, and cross slopes.

The following assumptions were used for all Project alternatives:

- Minimum clearance of 13'9" (14'6" desirable) at the arrivals and departures roadways; minimum clearance of 12' at the Terminal B arrivals; and minimum clearance of 11'0" (12' desirable) at the Terminal B departures.
- Speed limit of 20 miles per hour (MPH) on terminal area roadways; and speed limit of 20 MPH on entrance and exit ramps.
- Minimum lane width of 11'.
- Maximum profile grade for main roadways, public roadways, and ramps is 5 percent.
- Maximum profile grade for Authorized Vehicle Only ramps may exceed 5 percent.
- Sizing to accommodate a 60-foot articulated city bus.
- Reduced vehicular queuing onto Terminal Area Roadways; improved vehicular curbside operations; and separate weaving maneuvers between Terminals B and C to improve traffic safety.

2.2.4 Canopy and Curbside Requirements

During development of Project alternatives, considerations for the replacement canopy were based on the following criteria: technical feasibility, expanded travel lane coverage, visual impact from the terminal approach, visual impact from the pedestrian walkway, and pedestrian and vehicular experience under the canopy.

To properly shelter passengers and vehicles, the replacement canopy must:

- Be designed to be structurally and visually light, more open, and strive to be more welcoming.
- Cover all four of the proposed curbside drop-off curbs; and fit within the layout of the proposed departures deck expansion, existing deck framing and supports, curbside drop-off areas, and pedestrian walkway structure and supports.
- Avoid negative column and foundation impacts to the proposed and existing curbside improvements at both the Departures and Arrivals levels.

2.3 Project Alternatives

The following sections describe the No-Action Alternative and the alternatives considered for each Project element – the Terminal C Optimization/C to B Connector, Terminal B to C Roadways improvements, and Terminal C Canopy and Curbside improvements.

Alternatives were assessed based on their ability to meet the Project purpose and need outlined in Chapter 1, *Project Overview and Purpose and Need*.

2.3.1 No-Action Alternative

The No-Action Alternative reflects conditions to exist in the year 2030 if the Project is not implemented. It includes other planned projects by Massport in the airport terminal area. Projects in the Terminal Area are documented below. Other projects can be found in the *Logan Airport 2016 EDR*.[6]

- **Terminal E Modernization Project**: Adds seven gates to international Terminal E. The facility is approved and planned to be constructed in two phases – Phase 1 will add four gates and Phase 2 three gates. New passenger handling and holdrooms are planned as well as other possible upgrades. Final design is underway with construction expected to begin in 2019.
- **Terminal B Optimization Project**: Consolidates American Airlines operations to one pier of the terminal, connects all gates post security, and consolidates checkpoint operations. Upgrades the facilities on the Terminal B Pier B side including an enlarged ticketing hall, improved outbound bag area, expanded bag claim hall, concessions areas, and holdroom capacity. Construction is expected to be complete in late 2018.
- **Logan Airport Parking Project**: Adds up to 5,000 new on-airport commercial parking spaces following approval by the Massachusetts Department of Environmental Protection (MassDEP) and U.S. Environmental Protection Agency (EPA) to amend the Logan Airport Parking Freeze regulation, which allows for the additional spaces. This is expected to be a two-phase project, with Phase 1– the garage in front of Terminal E – is expected to come on line in 2022.
- **Logan Terminal B Garage Ramp Demolition and Access Roadway Bridge Reconstruction**: Demolishes the existing ramp access between Terminal B Departures and Arrivals Levels and the Terminal B Garage and constructs a new temporary entrance to the Terminal B Garage from the Arrivals Level Terminal Area Roadway. It also replaces the existing bridge section that forms a segment of the Departures Level terminal area roadway at the Terminal B entrance and the corresponding Arrivals Level entrance underneath the structure. A memorandum between Massport and the FAA documents this action[7] and is included in Appendix A. Initial work for this project is underway.

Alternatives were developed for each of the three Project's elements; (1) Terminal C Optimization and C to B Connector (terminal improvements), (2) Terminal B to C Roadways improvements, and (3) Terminal C Canopy and Curbside improvements. The Terminal C Optimization and C to B Connector component was further subdivided into alternatives developed for the Terminal building/proposed connector and those required for airside improvements.

6 Massachusetts Port Authority, 2016 Environmental Data Report (EDR) Boston-Logan International Airport, May 15, 2018. http://massport.com/environment/environmental-reporting/.
7 Massport memorandum to FAA dated February 22, 2018.

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FIGURE 2-1 Terminal C Existing Conditions - Terminal Building

Terminal C Canopy, Connector, and Roadway Project

Approximate Project Limits of Terminal C Optimization and Terminal B-C Connector

massport

Source: FMA

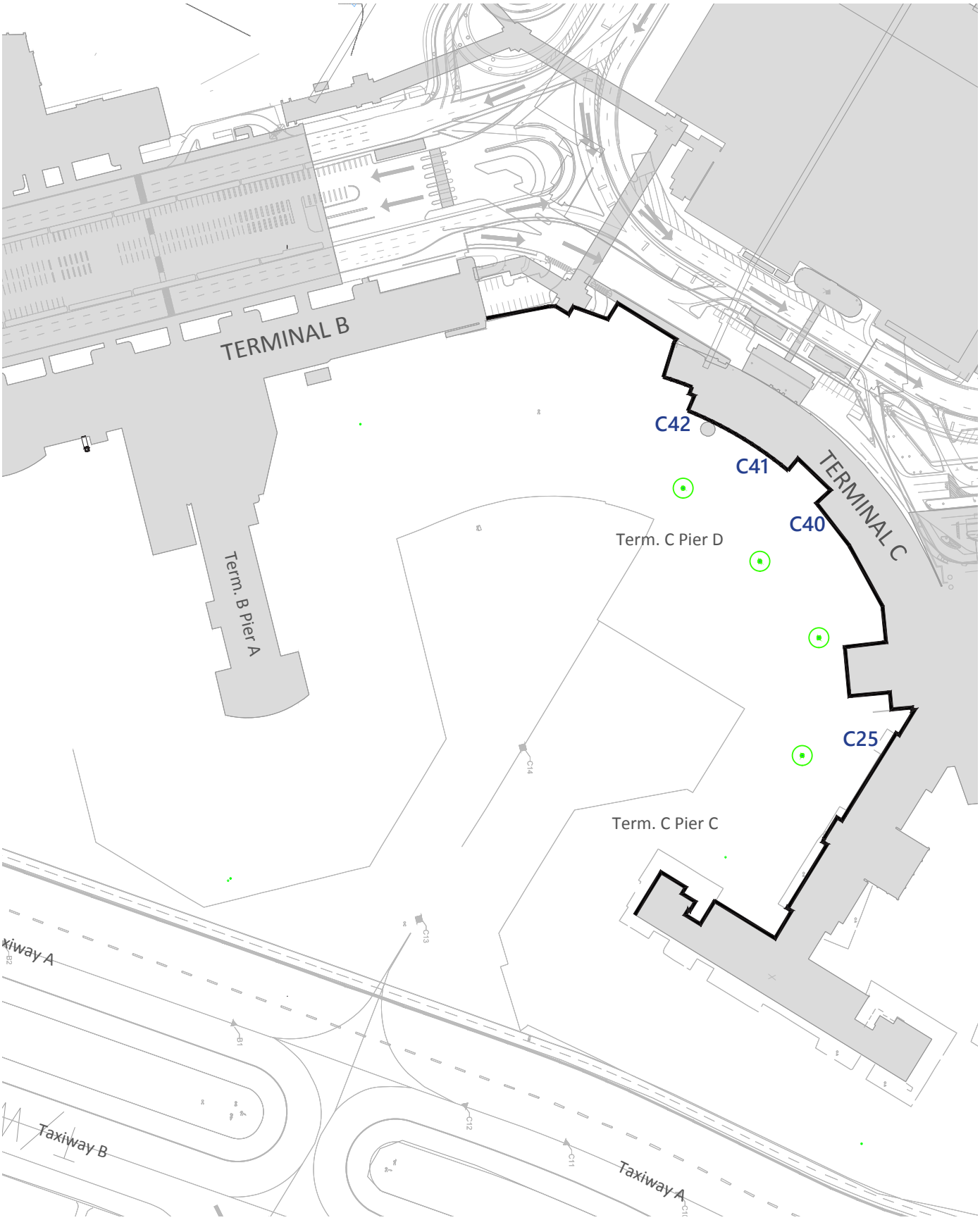

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FIGURE 2-2 Terminal C Existing Conditions - Airside

Terminal C Canopy, Connector, and Roadway Project

Existing Terminal Building

Existing Fuel Pits

Source: WSP

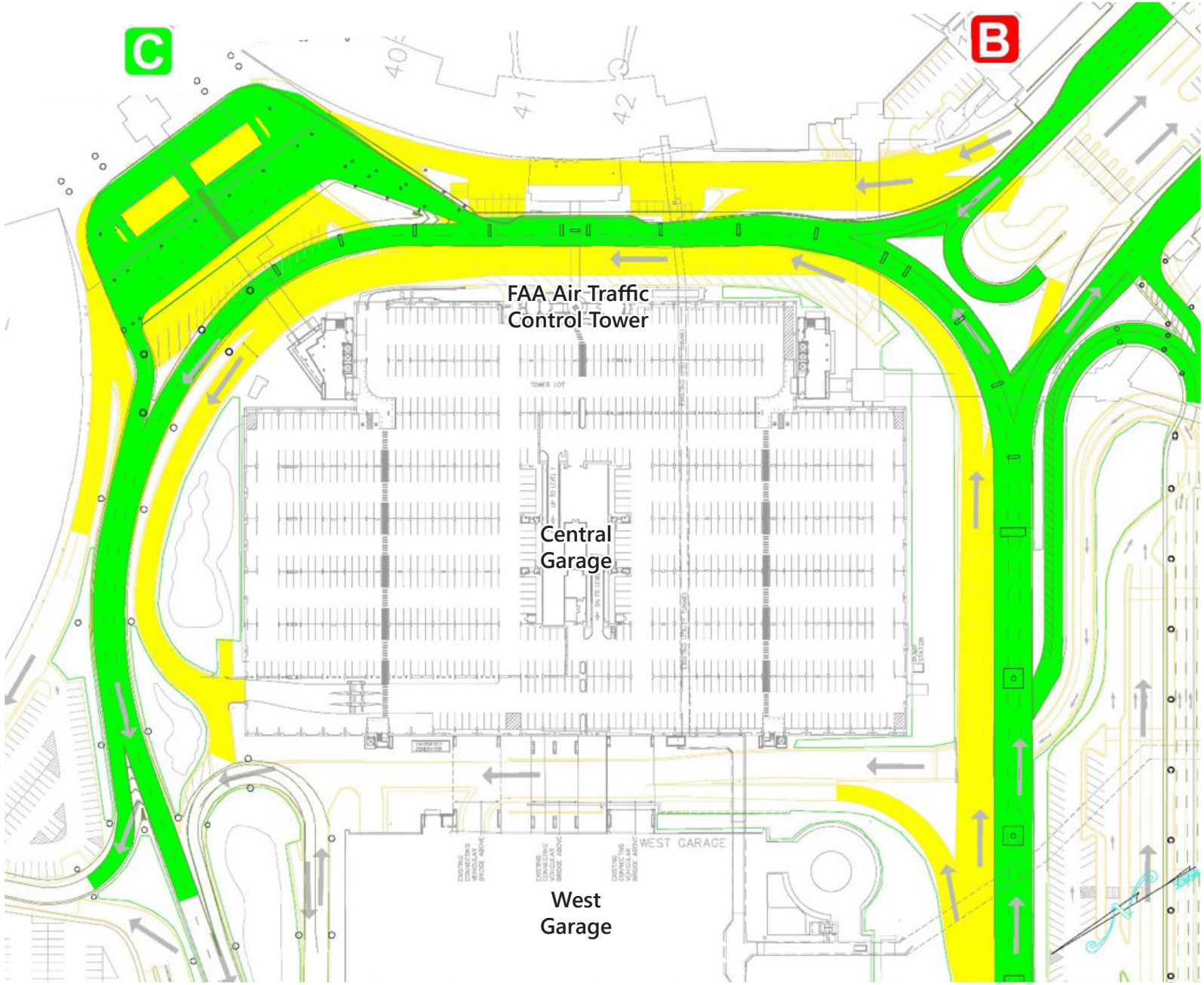

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FIGURE 2-3 Terminal C Existing Conditions - Roadways

Terminal C Canopy, Connector, and Roadway Project

Arrivals Roadways
Departures Roadways

Source: Stantec

Existing Terminal C

Existing Approach / Departures Level

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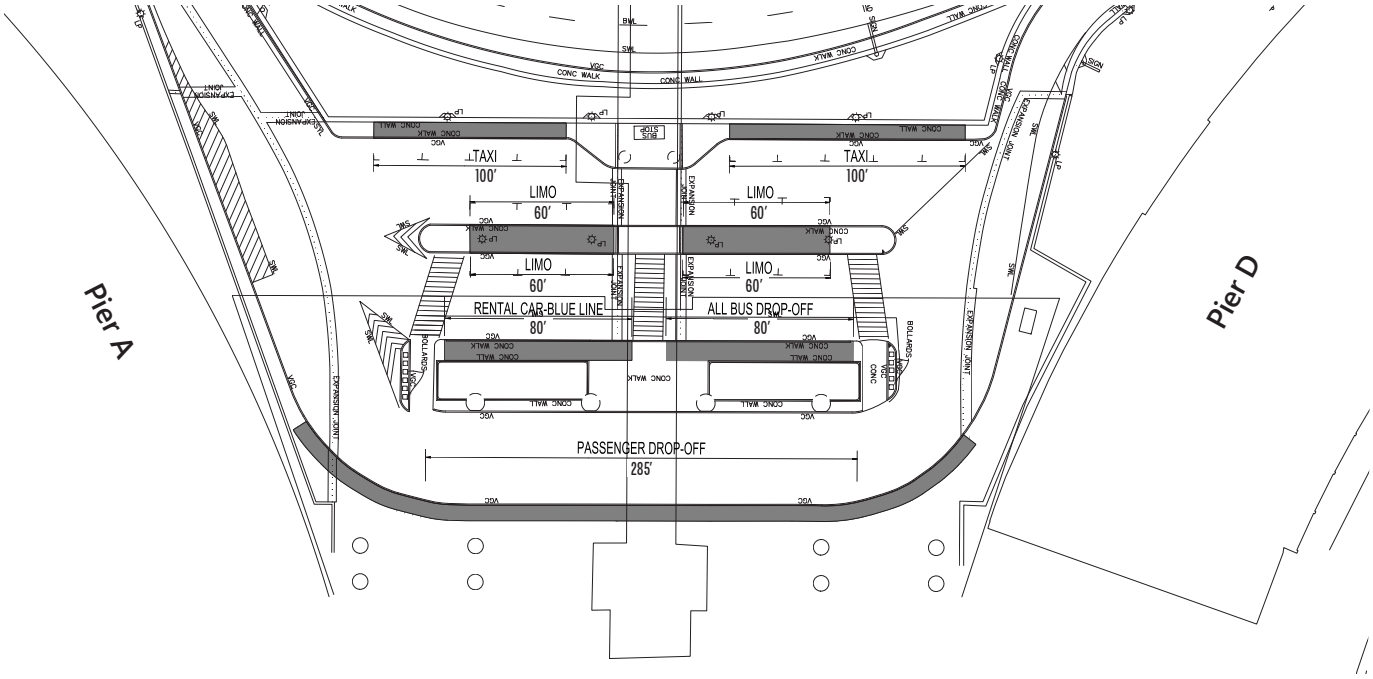
FIGURE 2-4 Terminal C Existing Conditions - Upper Deck Canopy

Terminal C Canopy, Connector, and Roadway Project

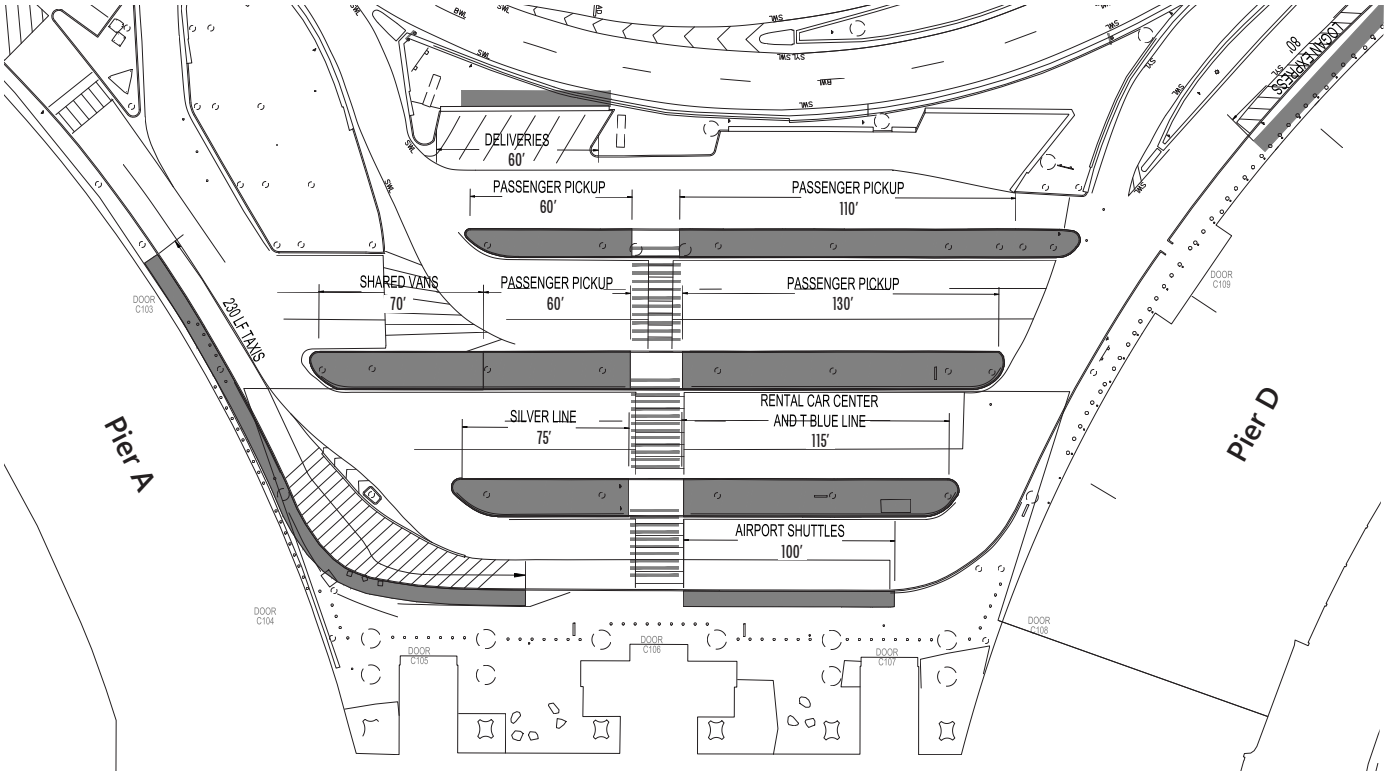
Existing Canopy

massport

Source: Stantec



Departures / Upper Level



Arrivals / Lower Level

\\vhb\proj\Wat-EVA\14055.00FM-MPA\graphics\FIGURES\Chapter_3_figures102318.indd

FIGURE 2-5 Terminal C Existing Conditions - Curbside

Terminal C Canopy, Connector, and Roadway Project

Existing Curb Area

Source: VHB

Terminal C is comprised of four piers (A, B, C and D) with Pier A currently connected to Terminal E. **Figures 2-1 through 2-5** illustrate the existing Terminal C building, airside, roadway, canopy, and curbside respectively. The No-Action Alternative assumes that passenger and aircraft activity levels would continue to increase without physical improvements at Terminal C, its arrival and departure curbs, or the surrounding access roadways. The No-Action Alternative does not address the Project goals and objectives nor the Project's purpose and need as discussed in Chapter 1, *Project Overview and Purpose and Need.* The No-Action Alternative would include routine maintenance and may include cosmetic upgrades to the terminal, emergency roadway repairs, or energy-related upgrades as part of Massport's ongoing sustainability initiatives.

Under the No-Action Alternative:

- Terminal C would not benefit from the realization of optimization opportunities and, as a result, existing issues related to airline operational efficiency and passenger inconvenience would continue and further degrade with passenger growth.
- TSA checkpoint locations would remain in two separate areas; there would be no security screening efficiency upgrades. The post-security connection of the whole Terminal C as well as between Terminals C and B would not be possible and thus, would fail to provide added flexibility in baggage and passenger handling when there are airlines relocations and/or mergers.
- The existing pre-security connection would be maintained, which coupled with the lack of post-security connection, does not offer enhanced pedestrian access.
- Passenger holdrooms would continue to be overcrowded, and concessions would not meet the standards seen at other Logan Airport terminals or other airports.
- The layout of the gates would not be modified to better accommodate the aircraft fleet mix and a new gate/jetbridge would not be provided. Aircraft would continue to park on the apron between terminals B and C.
- The existing roadway network would remain in place, with increased traffic congestion as the airport continues to experience growth.
- Terminal C curbsides would continue to operate at failing conditions, particularly during the morning peak hour on the departures level. Resulting congestion on the Terminal Area Roadways and in Terminal B would be exacerbated.
- Safety improvements associated in part with the removal of the weaving conditions between traffic exiting Terminal B and those entering Terminal C would not be realized.
- Inadequate shelter would continue to exist for passengers at the Departures Level
- The existing heavy, opaque canopy over Terminal C departures would remain, cutting off light to Terminal C and its curbside, and obstructing the view of the existing terminal building facade
- Existing waterproofing and leakage issues on the upper deck would remain or need repair through another project.
- Existing elevators continue to operate with substandard service.
- The Old Tower would remain in place, providing inadequate office space for services housed there.
- The vision of a new architectural gateway to Terminal C would not be realized.

The existing Terminal C is limited in its ability to accommodate evolving air carrier needs and enhanced passenger experience requirements. Improvements to the roadway network and the terminal curbside areas are

needed to provide safer, more efficient access to Terminal C and maintain unimpeded access to adjacent terminals. Therefore, the No-Action Alternative does not meet the purpose and need. The No-Action Alternative is discussed in further details in Chapter 4, *Environmental Consequences*.

2.3.2 Proposed Action Alternatives: Terminal C Optimization and C to B Connector

The Terminal C Optimization and C to B Connector is the first of three elements that ultimately make up the Proposed Action discussed in Section 2.4. Within each element, a series of initial alternatives was considered and focused on layout efficiency, cost, constructability, phasing, aesthetics, sustainability, resiliency, and feasibility. Four action alternatives were developed, evaluated, and screened as part of this element, two related to the Terminal C building renovations and enhancements and two alternatives related to the adjacent airside area.

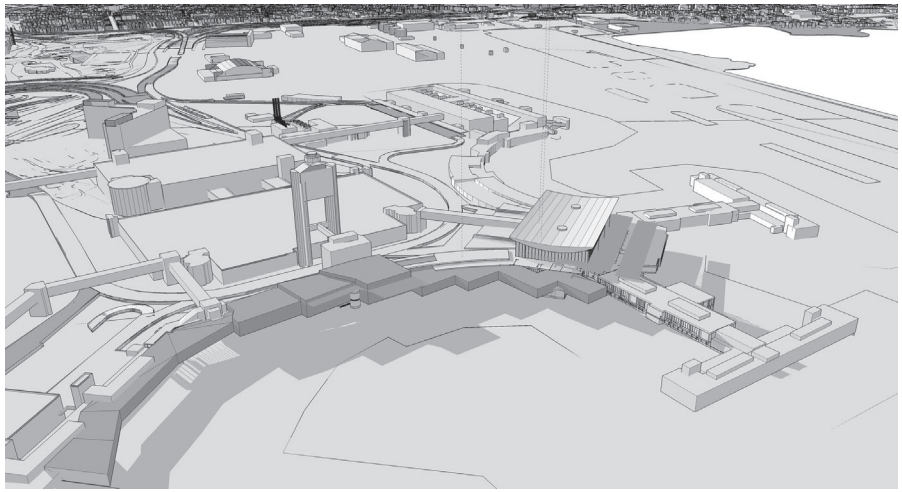
2.3.2.1 Terminal Building and Connector Alternatives

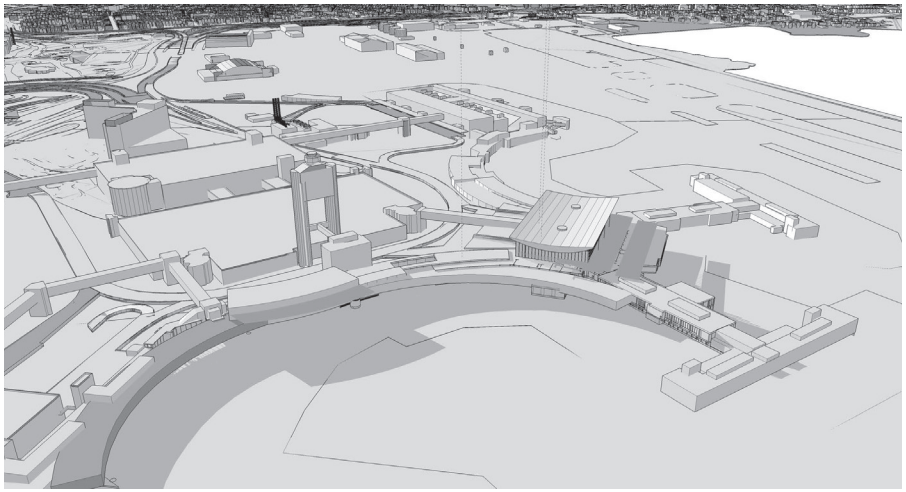
The Proposed Alternatives for the Terminal building and connector incorporate the additional building space required to provide a connection between Terminals C and B as well as office space to replace the existing space contained within the Old Tower. The majority of the personnel currently housed in the Old Tower will be placed in the renovated terminal building and new connector with a few divisions moving elsewhere within the airport. The key differences among the building alternatives relate to the external façade of the building, the distribution between amenities areas, energy usage and cost.

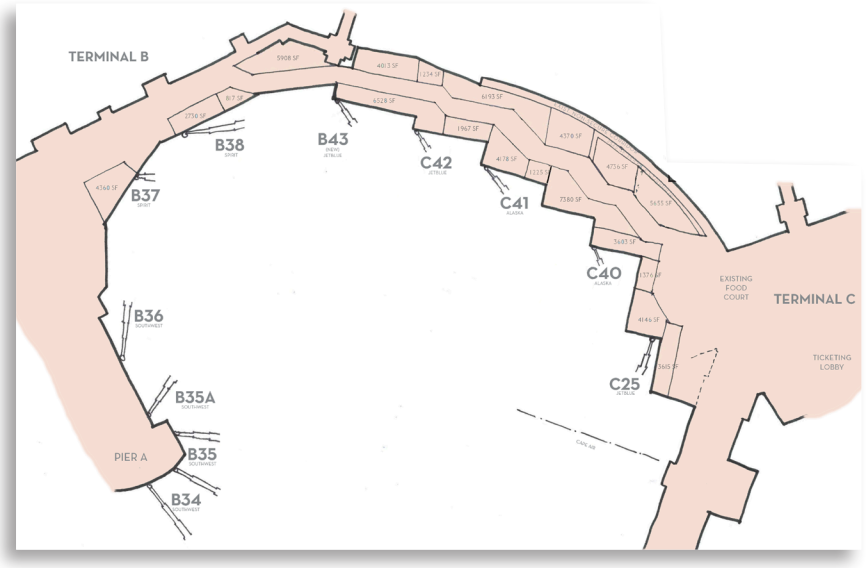
The **Sawtooth Alternative** (**Figure 2-6**) involves a net addition of approximately 84,315 square feet of building space including an expansion of approximately 121,050 square feet to the face of the existing Terminal C and the area between Terminal C and Terminal B, and provision of a third level for office space which will replace space currently accommodated within the 36,735 square foot Old Tower to be demolished. The Sawtooth Alternative includes improved functional efficiency of non-public and public spaces both pre- and post-security, better vertical circulation, consolidated passenger screening checkpoints, and enhanced passenger amenities. It also provides seamless post-security connection throughout Terminal C and between Terminal C and Terminal B and improved the existing pre-security pedestrian connection between Terminals C and B, and would allow for greater gate flexibility and enhanced passenger connectivity. The façade design of this alternative is comprised of glazed aluminum curtainwall and composite aluminum panels.

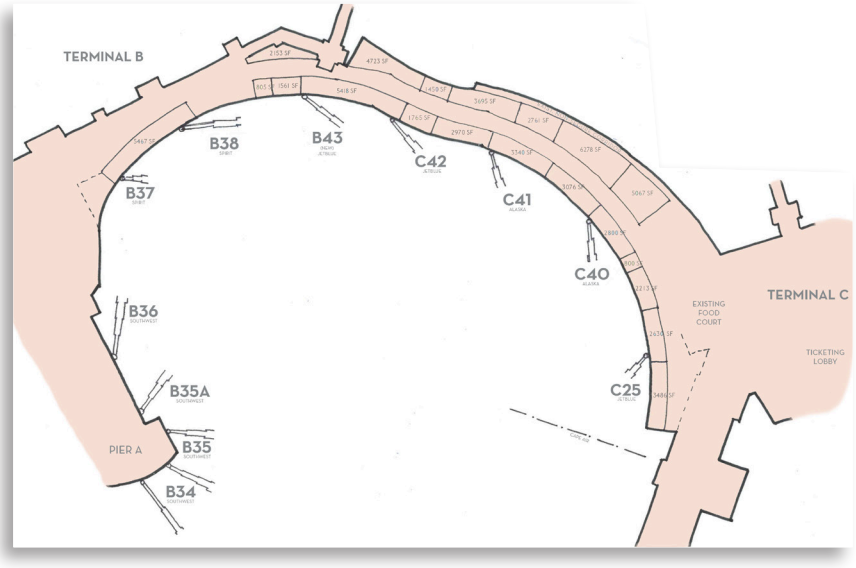
While the Sawtooth Alternative met the purpose and need of the Project, it would have energy inefficiencies and cost implications due to the approximately 20 percent more glazed curtainwall, which produced a higher window-to-wall ratio (WWR) resulting in higher energy demand with impacts on the building's heating and cooling systems.

The **Compound Curve Alternative** (**Figure 2-6**), was developed to improve upon the layout and energy inefficiencies present in the Sawtooth concept. It would reduce the amount of new building construction. The Compound Curve Alternative includes an expansion of approximately 110,750 square feet to the face of the existing Terminal C and the area between Terminal C and Terminal B, including providing a third level for office space. It includes similar components to the Sawtooth Alternative, such as improved functional efficiency, better vertical circulation, consolidated checkpoint, seamless passenger connectivity, and enhanced passenger amenities.









Sawtooth Alternative

Compound Curve Alternative (Proposed Action)

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FIGURE 2-6 Terminal C Building Alternatives

Terminal C Canopy, Connector, and Roadway Project

massport

Source: WSP

The **Compound Curve Alternative** was selected as the Proposed Action because it provides the most efficient layout given the Project constraints. This alternative has a reduced WWR and therefore lower energy demand, a cleaner line of sight, which would enhance wayfinding opportunities between the two terminals, and an improved cost due to the reduced materials used for the building.

Comparison of Terminal C Optimization and C to B Connector Building Alternatives

Massport must continue to provide safe, secure, and convenient facilities for its users and tenants. Each of the Action Alternatives considered would address the need to provide flexible and efficient facilities, in response to the changing airline industry, while enhancing the passenger experience. From an environmental perspective, there is very little difference between each of the Action Alternatives. All improvements would occur on previously developed impervious areas in active airport use.

The Sawtooth Building Alternative was found to cost more and be less energy efficient when compared to the Compound Curve Alternative. The Compound Curve Building Alternative was selected for its more efficient layout, energy considerations resulting from a lower amount of exterior perimeter facade surface, lower overall capital and operational cost, and better interior sightlines/passenger visibility throughout the concourse (supporting efficient and passenger-friendly wayfinding and a reduction in the need for supplemental directional signage). Therefore, this alternative is identified as the element to be included in the Proposed Action. **Table 2-2** details the Action Alternative evaluation factors for the building taking into account total square footage of new construction, interior renovation, and cost.

Table 2-2 Evaluation of Terminal C Optimization and C to B Connector Alternatives

	Sawtooth Alternative	Compound Curve Alternative (Preferred}
Total Square Footage	245,587 sf	245,587 sf
Additional Building Area	109,642 sf	109,642 sf
Interior Renovation	135,945 sf	135,945 sf
Removed Building Area[1]	36,735 sf	36,735 sf
Net New Building Area	72,907 sf	72,907 sf
Extent of Perimeter Façade	27,285 sf	22,542 sf
Wayfinding	More complex terminal layout	Clear sight lines within terminal
Estimated Cost	$166 million	$162.5 million

1 Old Tower

2.3.2.2 Airside Alternatives

Both airside Action Alternatives considered as part of this element incorporate an additional planned jetbridge, relocation of gates, provision of relocated fuel pits and regrading of apron areas. The main differences among the airside Action Alternatives relates to the impact on the operations of CapeAir.

Alternative A (**Figure 2-7**) was developed to accommodate ADG III aircraft, such as the A320 and Boeing 737 MAX families, and would configure five gates, jetbridges and relocate hydrant fuel pits to be compatible with these aircraft. This alternative would also create one additional jetbridge and five existing aircraft fuel pits would be repositioned. Minor apron grading would occur to ensure proper drainage for aviation safety purposes. The two 20-feet service roads surrounding the taxilane would be retained. This aircraft parking layout alignment and spacing under Alternative A would negatively impact the CapeAir ramp operations by reducing its apron area, and it would require the reorganization of aircraft parking layout. This layout alternative could lead to fewer aircraft stands available to CapeAir and degraded operational efficiency.

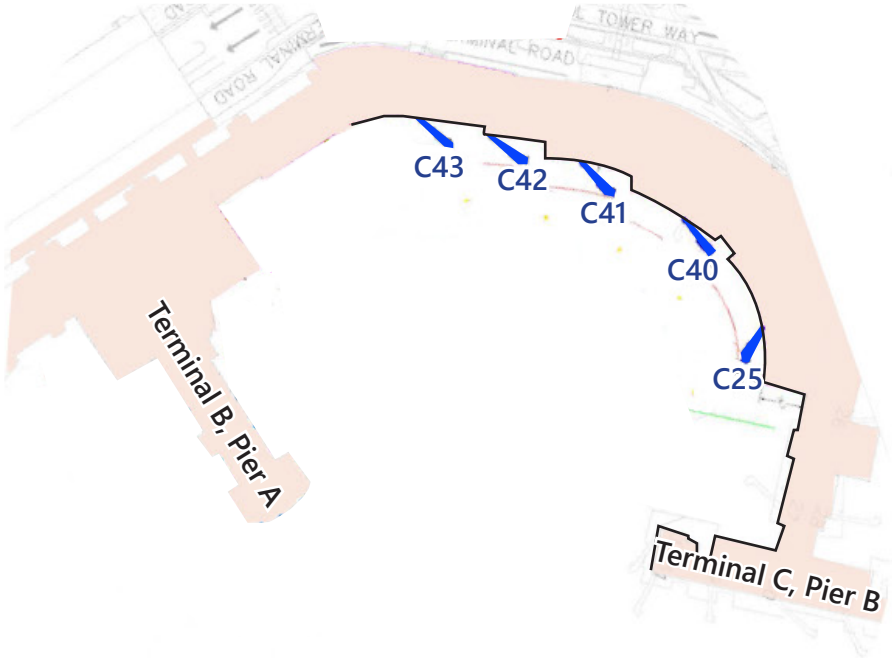
Alternative B (**Figure 2-7**) is similar to Alternative A, with the exception that it would not impact CapeAir operations. The aircraft parking layout alignment and spacing for this Alternative were developed to avoid the existing CapeAir apron area, thus leaving its ramp operations unaffected. Alternative B meets cost and operational requirements and improves airline efficiency.

Comparison of Airside Alternatives

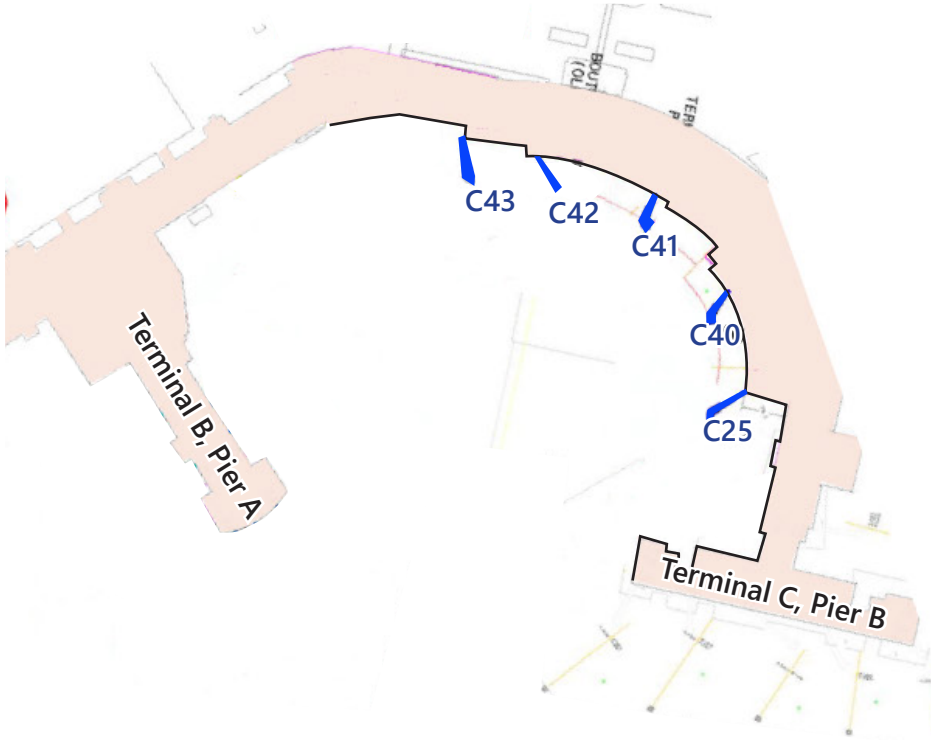
Both Airside Alternatives were designed to support the modified gate layout, include a new jetbridge and optimize operations. Airside Alternative A negatively affects CapeAir operations and therefore was dismissed from further consideration. Airside Alternative B meets the Project purpose without impacting CapeAir and is therefore identified as the Proposed Action for this program element. Table 2-3 compares the airside alternatives, and considers aircraft and airline accommodations.

Table 2-3 Evaluation of Terminal C Optimization and C to B Connector Airside Alternatives

	Alternative A	Alternative B (Proposed)
New Jet bridges	1	1
Fuel Pit Modifications	5	5
Airline Impacts		
Enhance Gate Capacity (# stands)	*Potentially Negative (CapeAir)*	*Positive*
Enhance Gate Capacity (# aircraft)	*Positive*	*Positive*
Maintain Airline Operations	*Negative (Cape Air)*	*None*
Maintain Airline Allocation	*Negative (Cape Air)*	*None*



Alternative A



Alternative B (Proposed Action)

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FIGURE 2-7 Airside Alternatives

Terminal C Canopy, Connector, and Roadway Project

Source: WSP

2.3.3 Action Alternatives: Terminal B to C Roadways Improvements

Since 2015, Massport has been evaluating options to reduce the traffic congestion between Terminal B and Terminal C. The Terminal B to C Roadway Improvements is the second of three elements that ultimately make up the Proposed Action discussed in Section 2.4. Within this element, alternatives were developed considering horizontal and vertical constraints, operational constraints, constructability, phasing and feasibility, and cost.

2.3.3.1 Preliminary Roadways Alternatives

Operational and design requirements for the Terminal B to C Roadways element were developed and refined throughout the evaluation of preliminary roadway alternatives. As such, by the end of this initial process, most alternatives being considered (13 of 14) were deemed infeasible.

The alternatives considered at the preliminary stage included the introduction of traffic signals on the terminal roadways, separating Departures Level terminal traffic onto separate viaduct structures, and/or depressing the Arrivals Level Terminal Area Roadway or Terminal ramp areas. Poor traffic operations, traffic safety concerns, insufficient vertical clearance, and major utility tunnel impacts are reasons why these preliminary alternatives were not considered feasible and therefore dismissed from further consideration.

2.3.3.2 Refined Roadways Alternatives

Following the initial study, a re-evaluation of the need for the Terminal B recirculation ramps, the desire for improvements to the curbside areas operations, and changes in design constraints, parameters and criteria, resulted in the development of a new set of roadway alternatives. All revised alternatives included an expanded Terminal C upper deck allowing for improvements to curbside areas on the Departures and Arrivals Levels; maintaining final-condition Arrivals Level curbside operations at the terminal building; and replacing the deteriorating viaduct. The following roadway improvements were considered:

Arrivals Level

- Construct new roadway for Terminal C traffic and ramp up to the Terminal B egress to departures level.
- Relocate and depress main terminal area roadway near Terminal B and cross the Terminal B egress ramp over relocated roadway.
- Split main terminal area roadway into a dedicated Terminal C traffic roadway and a dedicated Terminal E/Airport exit traffic roadway. The Terminal B egress ramp would ramp up to the departures level or merge with the new Terminal C roadway.
- Split main terminal area roadway into a dedicated Terminal B traffic roadway and a dedicated Terminal C and Terminal E/Airport exit traffic roadway. The Terminal B egress ramp would cross under the new Terminal C and Terminal E/Airport exit roadway while a Terminal B taxi egress ramp would be constructed. The Terminal B HOV egress ramp would also be maintained.

Departures Level

- Provide new Terminal B egress ramp for arrivals and departures traffic over the realigned main terminal area roadway. In addition, construct a new Terminal B HOV/taxi egress ramp.
- Relocate viaduct and ramp down Terminal B egress ramp to arrivals level plus construct a new Terminal B HOV egress ramp or maintain Terminal B HOV egress.
- Reverse Terminal C traffic pattern using old Terminal D frontage roadway.
- Split main terminal area roadway into a dedicated Terminal C traffic and taxis roadway and a dedicated Terminal B and Terminal E/Airport exit traffic roadway. The Terminal B egress ramp would cross over the main terminal roadway and a new Terminal B HOV egress ramp would be constructed (Preferred Alternative).

Similar to the preliminary roadway alternatives discussed above, several curbside alternatives were found infeasible due to significant impacts the existing utility tunnel, the creation of unusual traffic patterns, or other situations that may detract from the customer experience.

Except for the Preferred Alternative, all remaining Alternatives were deemed infeasible due to weaving conditions, excessive slopes and/or insufficient vertical clearance. The Preferred Alternative was the only alternative meeting all requirements as well as the Proposed Project's purpose and need and was consequently selected as the Proposed Action for this element.

Comparison of Terminal B to C Roadways Alternatives

Each of the Terminal B to C Roadways Alternatives considered would address the need to improve traffic congestion on the Terminal Area Roadways connecting Terminal B and Terminal C but vary in their ability to meet Massport's goal of providing safer, more efficient Airport access for its users. The preliminary options considered would not resolve the curbside area issues arising from insufficient space available on the Arrivals and Departures levels of Terminal C. The refined roadway options considered would better achieve this goal, but many have other constraints that resulted in the selection of a Preferred Alternative for this element.

2.3.4 Action Alternatives: Terminal C Canopy and Curbside Improvements

The Terminal C Canopy and Curbside improvements is the third element that make up the Proposed Action discussed in Section 2.4. The alternatives considered within this element were developed in conjunction with the Terminal B to C Roadways Improvements element. The new canopy will replace the existing Terminal C canopy and be expanded to cover the curb areas. All areas of construction are fully developed and in use for terminal ground access.

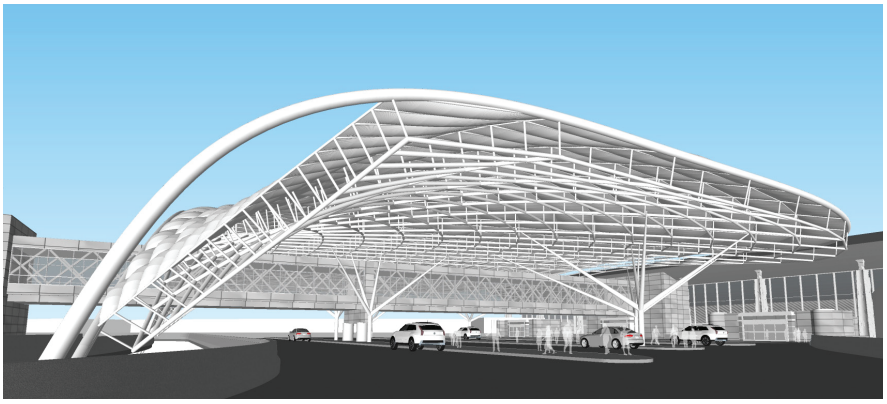
A variety of conceptual solutions were evaluated for the new Terminal C canopy to create a structure guided by the notion of flight; creating an open, light and spacious passenger environment that would provide a new architectural gateway to the terminal. Different configurations for the departures level were considered with the goal of maximizing curb space. Modifications to the Arrivals Level were also studied to maximize Arrivals Level curbside operations. It should be noted that replacement of the canopy and modifications to the curbsides at Terminal C require an active construction area on both the Arrivals and Departures Levels of Terminal C, the impacts of which are discussed in Chapter 4, *Environmental Consequences*. To facilitate construction, two existing elevators will be replaced and three new elevators (consisting of approximately 2,880 square feet) will be added adjacent to the baggage claim area on the Arrivals Level of Terminal C. These elevators will facilitate the movement of passengers to the Central Garage for a temporary active arrivals curbside during construction for pick-up by passenger cars, taxis, limousines, and TNCs such as Uber and Lyft. Bus and transit activity on the Arrivals Level will continue along the terminal curbside area.

The key differences among the canopy alternatives relate to the type of roof structure, materials, and shape. The key differences among the curbside alternatives relate to the allocation of curb space to different transportation modes as well as the overall amount of curb space available.

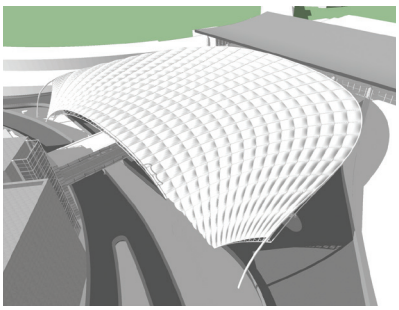
2.3.4.1 Canopy Alternatives

Initially, two general categories of canopy concepts were developed: concepts that covered all drop-off areas and islands with one roof structure; and concepts that covered all drop-off areas and islands with multiple roofs and structures. The advantage of multiple structures is that they could be staged during construction to preempt impacts to terminal operations as the canopy is put in place. Multiple profiles were studied, including flat, ached and sloped with various support column framing design shapes.

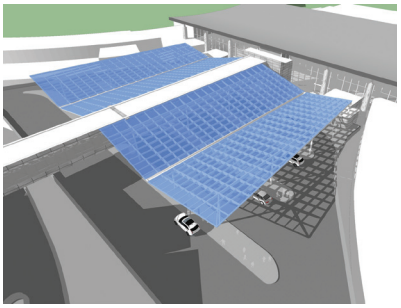
As the Project evolved, alternatives that did not meet architectural image and transparency goals were eliminated, including alternatives with a solid opaque roof surface (which do not provide increased natural lighting to the curb below) and alternatives that were a flat plane (which do not convey a distinct architectural image). Four additional concepts (shown in **Figure 2-8**) were further progressed:

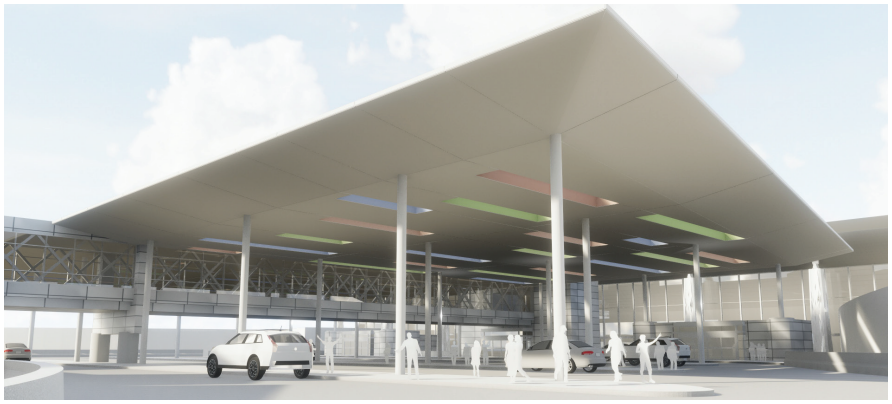


The Saddle

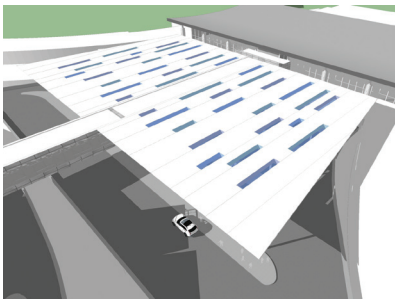


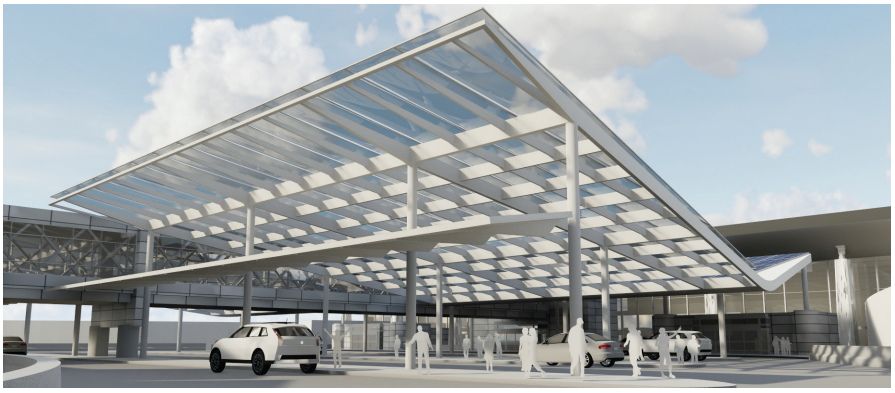
The Valley





The Skylight





The Launch

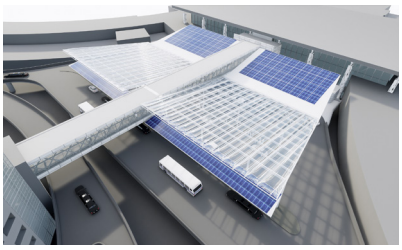


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FIGURE 2-8 Canopy Alternatives

Terminal C Canopy, Connector, and Roadway Project

massport

Source: Gensler

- **The Saddle**: This alternative has an organic shape that rises at the middle over the existing pedestrian bridge to the Central Garage and lowers near the canopy edges. The roofing surface would be a lightweight translucent polymer structural pillow system.
- **The Valley**: This alternative is a simple folded plane, with a central roof valley that runs parallel with the pedestrian bridge. The roofing material is a glass for this option, due to the slope and snow load limitations that preclude the use of a polymer structural pillow system.
- **The Skylight**: This alternative is the most cost-effective, but offers the least transparency to the roadway below. It is a simple flat roof plane with colored skylights. Unlike the existing flat roof canopy which aligns with the floor of the existing pedestrian bridge, this alternative is raised to align with the roof of the existing pedestrian bridge, affording more light, spaciousness and visibility to the existing face of Terminal C and curbside.
- **The Launch**: This alternative slopes upward in a welcoming gesture toward the departing passenger, with an offset low roof valley to control rain and snow. The roofing surface is a combination of a lightweight translucent polymer structural pillow system and opaque membrane roofing.

2.3.4.2 Curbside Alternatives

As described in section 2.3.3, in late 2016 Massport considered expansion of Terminal C curbside areas to enhance currently constrained operations, including adding to the existing five departures and ten arrivals terminal lanes. Several configurations were evaluated to optimize drop-off operations. The following summarizes the alternatives:

Departures Level

- **Alternative A**: Eight lanes with a total of approximately 660 feet of curb space; 190 feet would be allocated to HOVs with the remaining would be used by passenger cars, taxis, and limousines.
- **Alternative B**: Five lanes with a total of approximately 490 feet of curb space plus a potential for 10 limousine spaces; 190 feet would be allocated to HOVs with the remaining would be used by passenger cars, taxis, and limousines.
- **Alternative C**: Seven lanes with a total of approximately 770 feet of curb space. 190 feet would be allocated to HOVs, 250 feet to limousines and the remaining to passenger cars and taxis. This alternative would maintain the existing shelter area.
- **Alternative D**: Ten lanes with a total of approximately 1,010 feet of curb space. 190 feet would be allocated to HOVs, 220 feet to limousines and the remaining would be dedicated to passenger cars and taxis.
- **Alternative E**: Ten lanes with a total of approximately 1,100 feet of curb space. HOV would be allocated 295 feet with the remaining being used by passenger cars, taxis, TNCs and limousines.

Arrivals Level

- **Alternative 1**: Ten lanes with a total of approximately 1,020 feet of curb space. Taxis and HOV's would use 690 feet of the space, with the remaining being used by passenger cars and limousines. This alternative would displace terminal deliveries. Pick-up along the former Terminal D curbside would remain unchanged. Additionally, passenger vehicles would be separated from all other vehicles, if desired, during busy times.
- **Alternative 2**: Ten lanes with a total of approximately 1,120 feet of curb space. HOV would be allocated 295 feet and taxis 215 feet, with the remaining would be used by passenger cars. This alternative would displace terminal deliveries. Pick-up along the former Terminal D curbside would remain unchanged.

On the Departures Level, Alternatives A and B did not consider an expansion of the upper deck, and consequently resulted in less curbside space than the other options. Alternative D and Alternative E would expand the upper deck, however, Alternative E resulted in the most efficient configuration with an additional travel lane proposed. Thus, Alternative E was selected as the Proposed Action for this element.

On the Arrivals Level, both Alternatives 1 and 2 for the curbside arrivals level would increase curb space, however Alternative 2 would provide the largest amount of curb space and the most efficient configuration and thus was selected as the Preferred Alternative for this element.

Comparison of Terminal C Canopy and Curbside Improvements Alternatives

Massport must continue to provide efficient and convenient curbside facilities for its users. Each of the Canopy and Curbside Alternatives considered would address the need to provide improved curbside operations, while enhancing the passenger experience.

The Launch was selected as the Proposed Action for the canopy element, as it has a distinct architecture image and is highly translucent, thus providing increased natural lighting to the curb below.

Alternative E was selected as the Proposed Action for the departures level because it would provide the largest amount of curb space and the most efficient configuration, with six additional lanes to assist in the effective movement of traffic flow. Similarly, Alternative 2 was selected for the arrivals level element, since it would provide an additional 400 linear feet of curb and one additional travel lane.

2.4 Proposed Action

The Terminal C Canopy, Connector, and Roadway Project are needed to improve passenger service and convenience, efficiency for passengers and airlines, passenger pick-up/drop-off experience, and roadways operations and safety. The improved Terminal C and the new C to B Connector would provide both pre-security and post-security connectivity, allowing for flexibility in baggage and passenger handling including security. It would also consolidate the TSA checkpoint locations, thus improving efficiency. Enhanced pedestrian access pre-security would also be provided, passenger holdrooms would be expanded, and concessions spaces would be improved. The improvements would include modifications to gates layout allowing for better aircraft fleet mix accommodations. New office space would replace inefficient and out-of-date space located in the Old Tower Facilities.

The construction of new roadway infrastructure would improve traffic operations and help increase traffic congestion associated with airport growth. The new roadways would also eliminate existing weaving conditions between traffic exiting Terminal B and those entering Terminal C improving safety. Aging infrastructure in need of repair would be replaced.

The expansion and reconfiguration of the Terminal C arrivals and departures levels curbside would improve operations, reducing existing queues that create gridlock and exacerbate poor traffic conditions. The new canopy would enhance lighting conditions, accentuate the visibility of the terminal and provide shelter for passengers at the departures level. Existing waterproofing and leakage issues on the upper deck would also be repaired.

As summarized below, the Proposed Action includes Massport's recommended alternatives for each of the three key elements; (1) Terminal C Optimization and C to B Connector, (2) Terminal B to C Roadways Improvements, and (3) Terminal C Canopy and Curbside Improvements.

2.4.1 Proposed Action: Terminal C Optimization and C to B Connector

The Compound Curve Alternative (**Figure 2-9**) was selected for the building elements of the Proposed Action because it provides the most efficient layout given the Project constraints, better sustainability components, superior wayfinding, and lower costs. **Alternative B** (**Figure 2-10**) is the preferred airside concept as it does not impact CapeAir operations.

The Proposed Action includes renovation of approximately 136,000 square feet and construction of approximately 110,000 square feet of new space. It also includes the demolition of 37,000 square feet of office currently located in the Old Tower, resulting in a net addition of approximately 73,000 square feet of building space. The Proposed Action includes improvements to the aircraft gates layout and associated airside changes as well as the provision of one additional jetbridge in an area where aircraft currently park. The Proposed Action improves flexibility, efficiency, security and connectivity within Terminal C and between Terminals C and B. It also enhances passenger experience and allows for the replacement of inefficient office space currently located in the Old Tower building.

Project improvements are summarized below:

Building

- Modify vertical circulation and public access from departures level to baggage claim areas and to curbside pick-up.
- Provide continuous connection of lower level non-public support functions between Terminal C and Terminal B.
- Renovate non-public airport support operations, and renovate public spaces both pre- and post-security to improve functional efficiency.
- Consolidate passenger screening checkpoint.
- Reconstruct pre-security pedestrian connection between Terminal C and Terminal B.
- Improve passenger amenities.

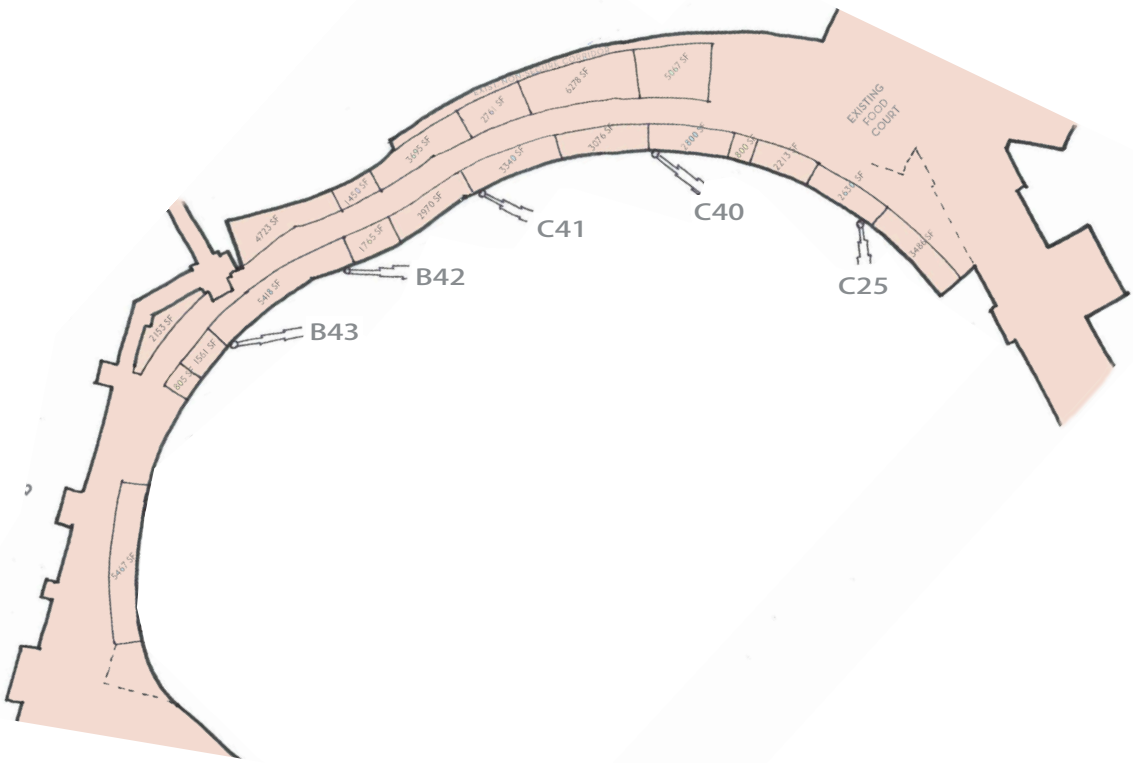

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FIGURE 2-9 Proposed Action - Terminal C Building

Terminal C Canopy, Connector, and Roadway Project

Source: FMA

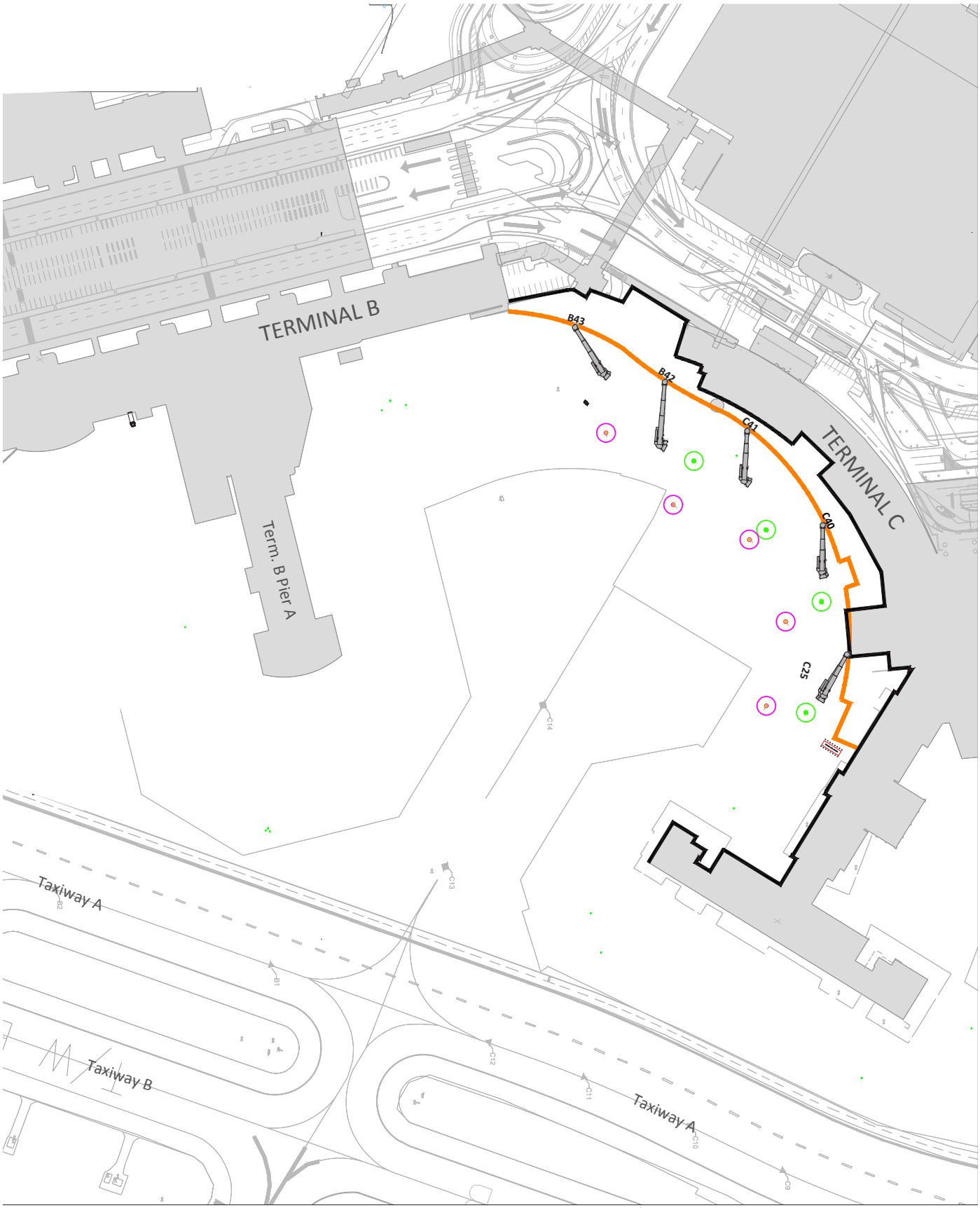

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FIGURE 2-10 Proposed Action - Airside

Terminal C Canopy, Connector, and Roadway Project

Existing Terminal Building
Proposed Facade (2nd Floor)
Existing Fuel Pits
Proposed Fuel Pits

Source: WSP

- Construct a continuous passenger connection post-security between Terminal C and Terminal B
- Upgrade Gate 40-43 public corridors, holdrooms, restrooms and concessions.
- Construct new office space to replace existing space located in Old Tower.
- Demolish Old Tower office building.

Airside

- Adjust aircraft parking locations between gates C42 to C25 for more efficient aircraft and gate layout.
- Provide one additional gate/jetbridge.
- Relocate five fuel pits.
- Regrade apron areas to accommodate Project drainage.

2.4.2 Proposed Action: Terminal B to C Roadways Improvements

Alternative Z-4 (**Figure 2-11**) was selected as the Proposed Action for the roadway improvements element. This Alternative eliminates the arrivals and departures levels weave conditions, and resolves existing traffic congestion and delays. It also replaces aging infrastructure in need of repair.

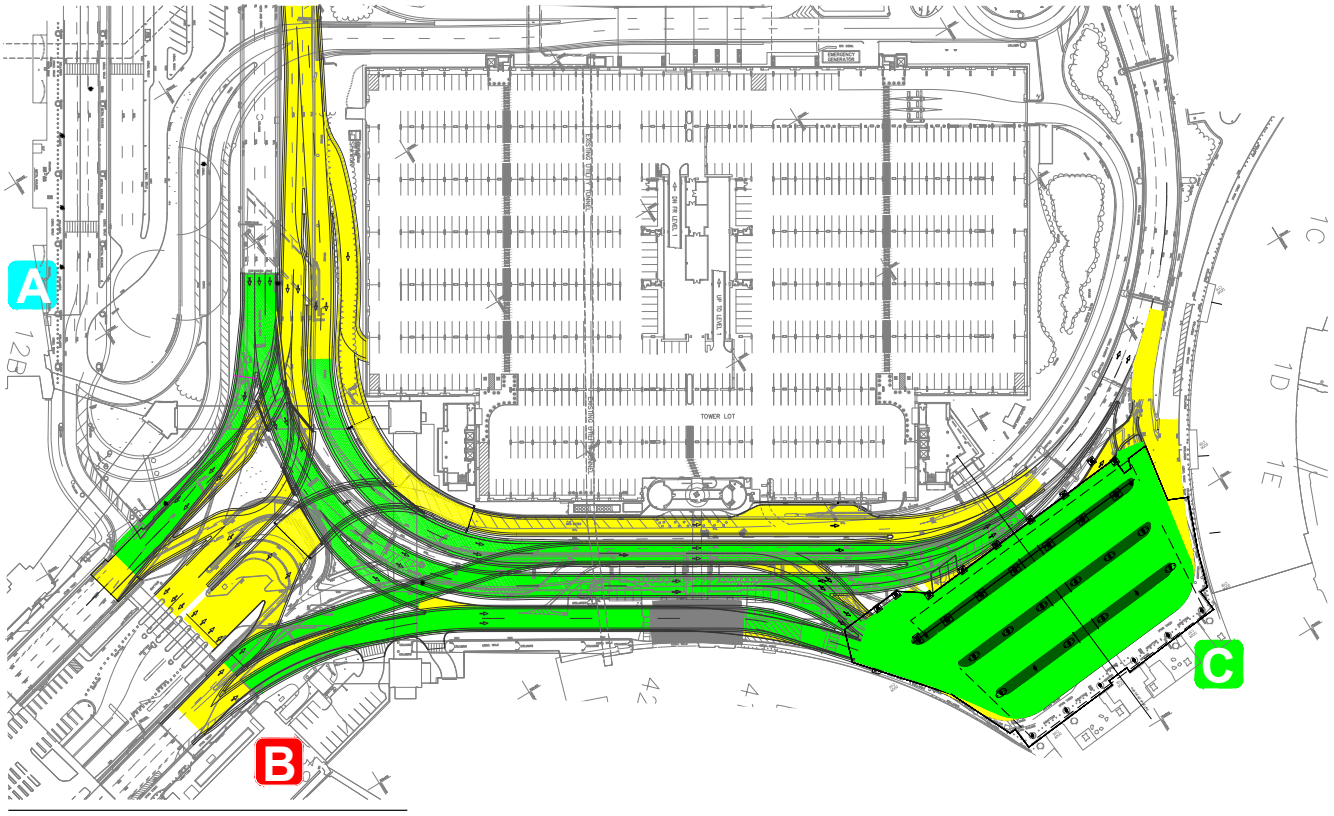
The key features of the Alternative Z-4 include a reconfiguration of ramps entering and exiting Terminal B, at both levels, as well as ramps entering Terminal C. Project improvements are summarized below:

Terminal B

- Relocate the departures terminal area roadway.
- Create new ramp for Terminal B entering traffic to the arrivals level.
- Relocate Terminal B exiting traffic from the arrivals level and departures level to eliminate existing weaving conditions.
- Raise arrivals terminal area roadway to accommodate the new Terminal B egress tunnel.

Terminal C

- Create a ramp for taxis from the departures terminal area roadway to Terminal C arrivals.
- Create a ramp for buses from the Terminal B egress viaduct to the Terminal C departures deck.
- Reconstruct the Terminal C departures level viaduct and arrivals level roadways.



Roadways - Proposed Action

Rendering of Proposed Roadway Improvement - View from Terminal B Garage

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FIGURE 2-11 Proposed Action - Roadways

Terminal C Canopy, Connector, and Roadway Project

Arrivals Roadways
Departures Roadways

massport

Source: Stantec

2.4.3 Proposed Action: Terminal C Canopy and Curbside Improvements

Alternative 2 (Arrivals) and Alternative E (Departures) (**Figure 2-12**) were selected for the curbside elements of the Proposed Action The preferred option for the canopy is the Launch **(Figure 2-13**). Project improvements are summarized below (**Figure 2-14**):

Canopy

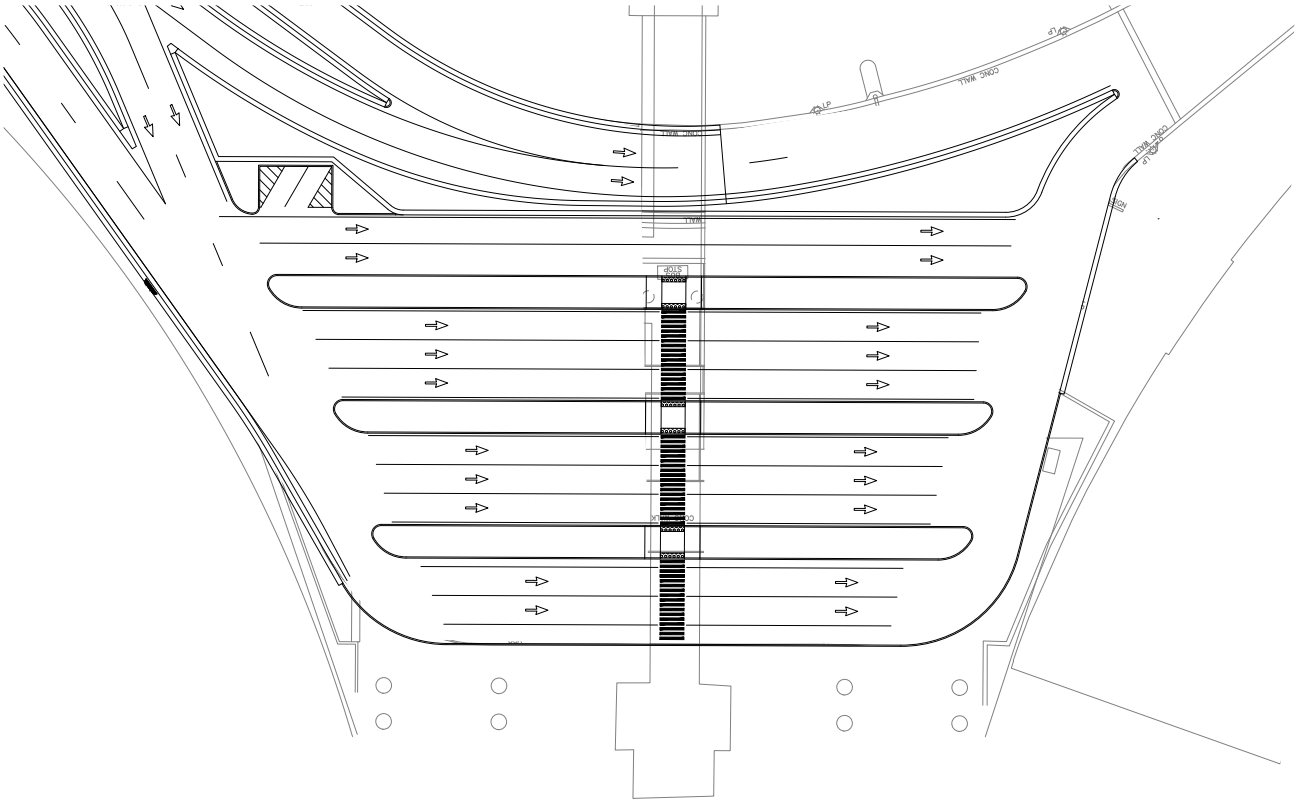
- Provide full weather protection for passengers at the departures level.
- Increase natural lighting to the curb below.
- Improve Terminal C visibility to users.
- Provide architectural gateway to Terminal C. Include new elevators to improve passenger movement between Terminal C and the Central Parking Garage.

Arrivals Level

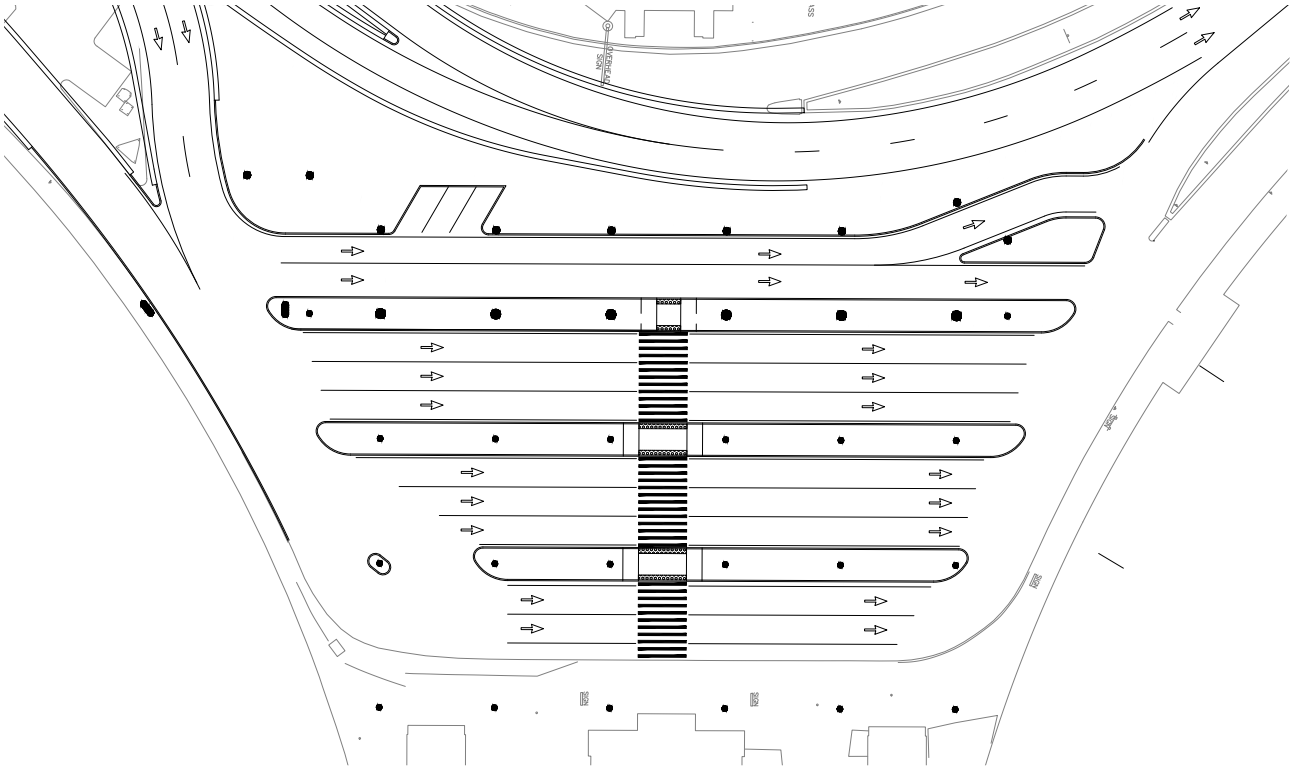
- Add approximately 110 linear feet of curb space to improve pick-up operations.
- Add one travel lane to improve traffic flow in the pick-up areas.
- Reconfigure curbside usage, relocating vans and Terminal delivery areas.
- Update Terminal signage.

Departures Level

- Provide additional new deck area and repair existing upper deck to provide increased curb length, additional travel lanes, and eliminate waterproofing and leakage issues.
- Add approximately 420 linear feet of curb space to improve drop-off operations.
- Add six travel lanes to improve traffic flow in the drop-off areas.
- Reconfigure curbside usage; provide three curbs for passenger car and taxi drop-off and one curb for combined HOV and limousine drop-off.
- Update Terminal signage



Departures Level



Arrivals Level

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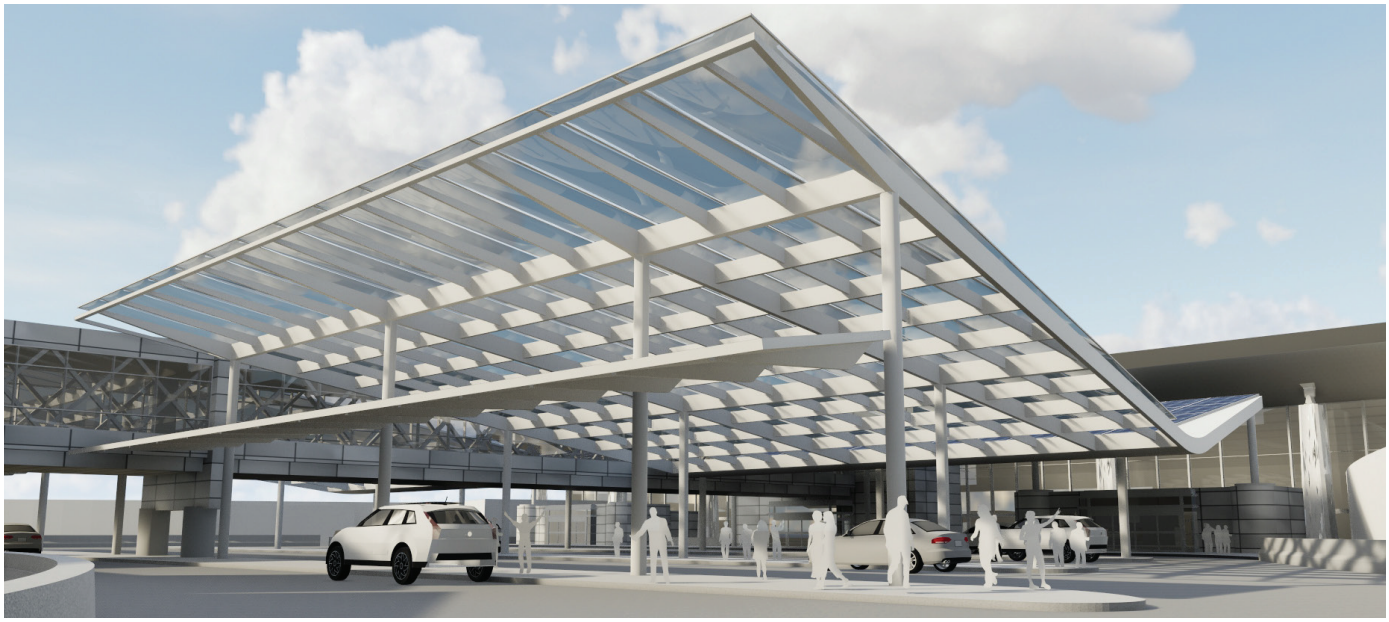
FIGURE 2-12 Proposed Action - Curbside

Terminal C Canopy, Connector, and Roadway Project

massport

Source: Stantec



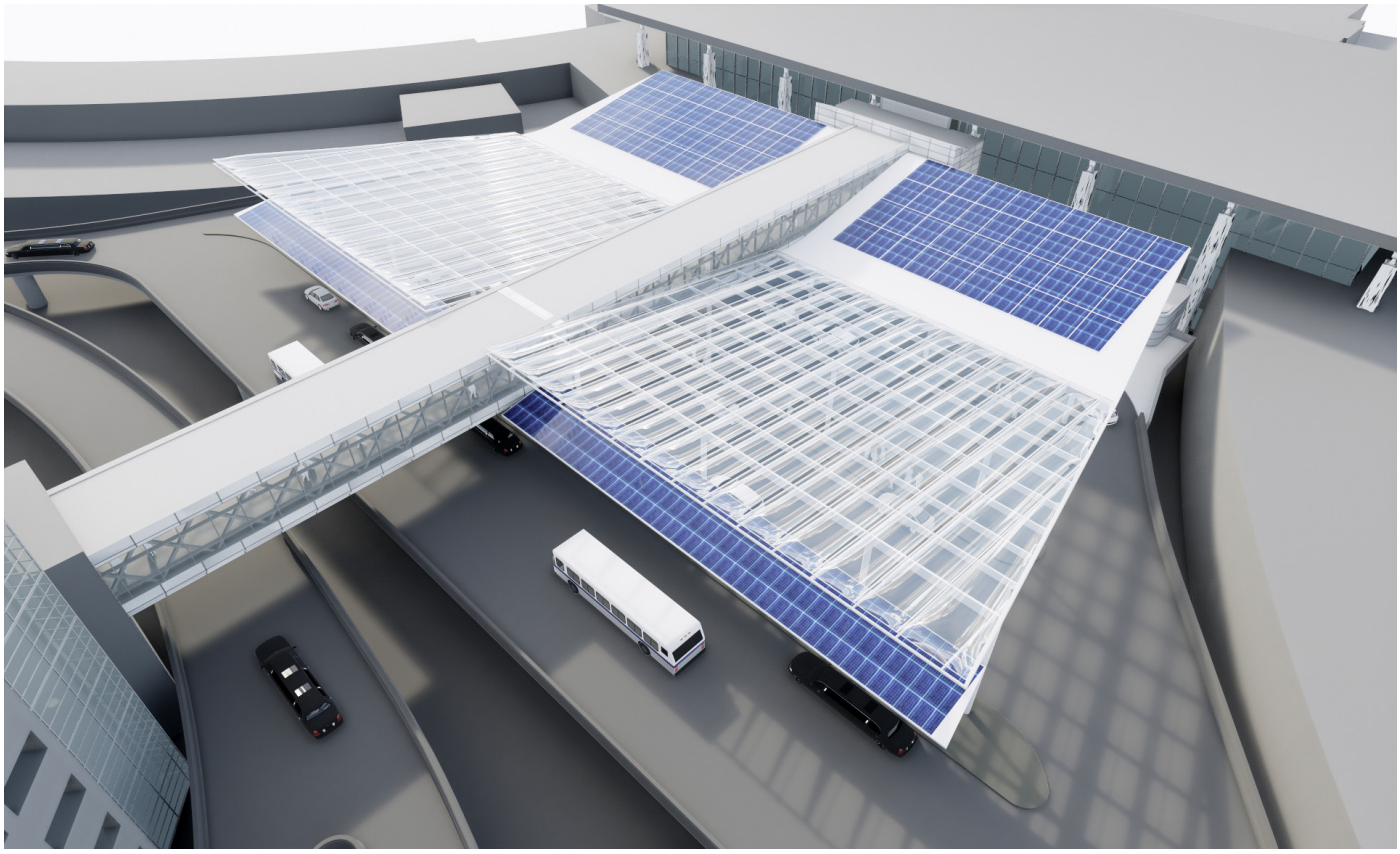


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FIGURE 2-13 Proposed Action - Canopy

Terminal C Canopy, Connector, and Roadway Project

Source: Gensler

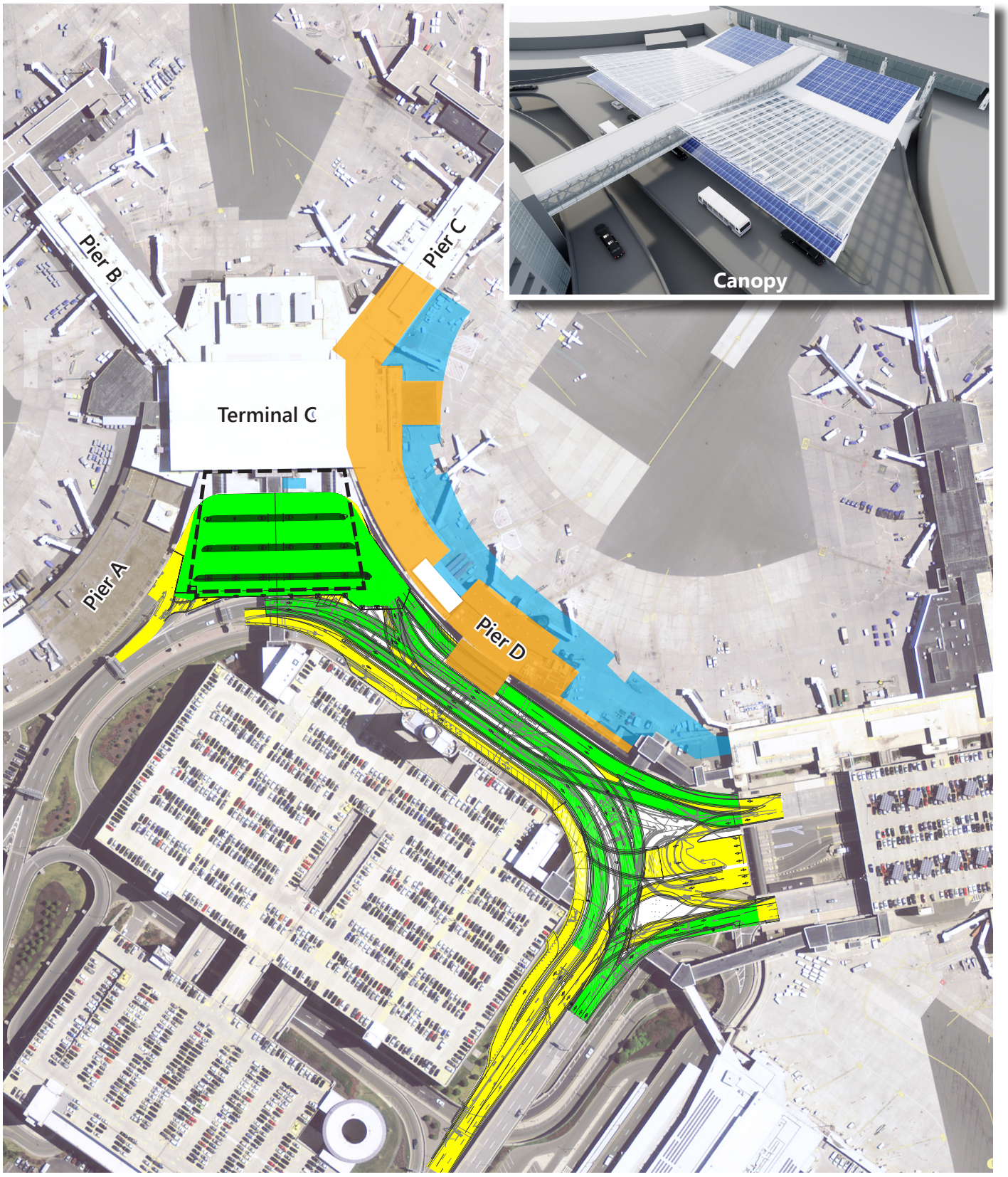

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FIGURE 2-14 Proposed Action

Terminal C Canopy, Connector, and Roadway Project

Arrivals Roadways
Departures Roadways
New Construction
Renovation
Canopy

massport

Source: FMA, Gensler, Stantec

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3 Affected Environment

3.1 Introduction

This chapter of the Environmental Assessment (EA) describes the environment in which the Terminal C Canopy, Connector, and Roadway Project (the Proposed Action or Proposed Project) would occur. It documents the affected environment relative to each applicable environmental resource category, as specified in Federal Aviation Administration (FAA) *Order 1050.1F*[1] and *Order 5050.4B*.[2] Consistent with Massport practice, broader Airport-wide environmental issues and additional cumulative impacts are addressed in Massport's *Environmental Status and Planning Reports* (ESPR) and *Environmental Data Reports* (EDR).

3.2 Project Environmental Setting

The following section describes the general environmental characteristics of Logan Airport and, more specifically, the Project Area.

3.2.1 Physical Setting

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor, and is one of the most land-constrained airports in the nation. The Airport is located primarily on filled land and is surrounded by water on three sides. Logan Airport is close to downtown Boston and is accessible by both public transit and a well-connected regional roadway system. The airfield comprises six runways, approximately 15 miles of taxiway, and approximately 240 acres of concrete and asphalt apron. Logan Airport has four passenger terminals (Terminals A, B, C, and E), each with its own ticketing, baggage claim, and ground transportation facilities. Massport continues to evaluate and implement enhancements to Logan Airport's safety, security, operational efficiency, and accessibility to and from the Boston metropolitan area, while carefully monitoring the environmental effects of Logan Airport operations.

3.2.1.1 Terminal C

Terminal C, comprised of four individual piers is the oldest terminal at Logan Airport. Opened in 1967, it has undergone major renovations three times, most recently in 2005. There have been subsequent minor renovations more recently. In 2016, Massport completed the Terminal C to E connector, allowing for a seamless post-security connection between those two terminals. Upon completion of that connection, the three former Terminal D

1 FAA. 2015. *Order 1050.1F: Environmental Impacts: Policies and Procedures.*
2 FAA. 2006. *Order 5050.4B: National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.

gates were renumbered as Terminal C gates. Terminal C is home to the Airport's United Services Organizations Inc. lounge and the Airport chapel, Our Lady of the Airways, which was opened in 1951 and is the first airport chapel in the United States. Although airlines frequently relocate, Terminal C currently serves jetBlue Airways (Logan Airport's largest air carrier), Aer Lingus, Alaska Airlines, Cape Air, Sun Country Airlines, and TAP Portugal.

The Terminal C Canopy, Connector, and Roadway Project consists of three components discussed in detail in Chapter 2:

- Terminal C Optimization and C to B Connector
- Terminal B to C Roadways Improvements
- Terminal C Canopy and Curbside Improvements

3.2.2 Overview of Environmental Resource Categories Evaluated

FAA *Order 1050.1F* requires the evaluation of applicable impact categories. This EA provides a detailed assessment of existing conditions where relevant. **Table 3-1** identifies the National Environmental Policy Act (NEPA) impact categories that this document evaluates, along with a description of the potential effects to these categories from any of the alternatives. Categories that apply to the Proposed Project and that are evaluated in this EA are noted in **Table 3-1** with a "yes." Chapter 4, *Environmental Consequences,* evaluates the direct, indirect, and construction-period impacts of these applicable categories.

Table 3-1 National Environmental Policy Act (NEPA) Environmental Resources Evaluated in this Environmental Assessment (EA)

EA Section #	Environmental Resource Category[1]	(Yes/ No)	Explanation
3.2.3	Surface Transportation	Yes	Typically ground transportation is addressed as part of community disruption as part of the Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks category. The Proposed Project does result in changes to the Airport roadway network or curbs. Therefore, for the purposes of this EA, ground transportation effects are associated with the Proposed Project.
3.2.4	Air Quality	Yes	This category is included to assess short-term construction period impacts and potential impacts associated with expanding the Terminal C departures level curb side deck. The Proposed Project would not affect the number of current or projected future aircraft operations or generate new ground access vehicle trips. See Section 3.2.4, *Air Quality* for additional information.
3.2.5	Noise and Noise-Compatible Land Use	Yes	This category is included to assess short-term construction period impacts. The Proposed Project would not increase the number of aircraft operations or passenger activity levels; therefore, aircraft noise levels at or surrounding the Airport would not be expected to change compared to the No-Action Alternative. Section 3.2.5*, Noise and Noise-Compatible Land Use* discusses the noise environment at Logan Airport.
3.2.6	Natural Resources and Energy Supply	Yes	This category is included to assess the demand for natural resources, including potable water, consumable materials, and energy during Project construction, operation, and maintenance. The Project would cause limited additional demands on energy supplies and other resources that can be accommodated by current power suppliers. See Section 3.2.6, *Natural Resources and Energy Supply* for additional information.
3.2.7	Climate	Yes	This category is included to assess the Project's potential impact on climate change and also to assess how climate change might impact the Project. Elements of the Project would be built to Leadership in Energy and Environmental Design (LEED®) Commercial Interiors, Gold standards. The Project would include energy efficiency and resiliency measures. See Section 3.2.7, *Climate,* for additional information.
3.2.8	Historical, Architectural, Archaeological, and Cultural Resources	Yes	This category is included because of the presence of Our Lady of the Chapel inside Terminal C, which is included in the Inventory of Historical and Archeological Assets of the Commonwealth and may be eligible for inclusion on the National Register of Historic Places. Existing structures planned for demolition are in excess of 50-years old but are not considered eligible for listing on the National Register. See Section 3.2.8, *Historical, Architectural, Archeological, and Cultural Resources* for additional information.
3.2.9	Water Resources (including Wetlands, Floodplains,[2] Surface Waters, Groundwater, and Wild and Scenic Rivers[3])	Yes	This category is included to assess the Project's potential to impact surface waters during construction, operation, and maintenance. Although the area is almost entirely paved, the Proposed Project creates a small increase in impervious surface (2,800 SF). There are no wetlands, floodplains, or Wild and Scenic Rivers within the area of the Project footprint.[2,3] (Thus only surface waters are considered.) See Section 3.2.9, *Water Resources* for additional information.
3.2.10	Hazardous Materials, Solid Waste, and Pollution Prevention	Yes	This category is included due to the potential to encounter hazardous materials during construction. The Proposed Project includes excavation for foundations and utilities, which may encounter contaminated soils. See Section 3.2.10, *Hazardous Materials, Solid Waste, and Pollution Prevention* for additional information.

Table 3-1 (Continued) National Environmental Policy Act (NEPA) Environmental Resources Evaluated in this Environmental Assessment (EA) (Continued)

EA Section #	Environmental Resource Category[1]	(Yes/ No)	Explanation
3.2.11	Coastal Resources	Yes	This category is included because Logan Airport is located within the Massachusetts Coastal Zone. The proposed Project Area is entirely within previously developed/disturbed portions of the Airport and well removed from Boston Harbor. The Proposed Project is limited to paved areas of the airfield and terminal that are already in use for aviation or transportation purposes, and would not change the manner of use or quality of land in the coastal zone. See Section 3.2.11, *Coastal Resources* for additional information.
3.2.12	Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	Yes	This category is included because several Environmental Justice communities surround Logan Airport. The Project would result in economic benefits related to construction and new goods/services in the form of temporary jobs and on-Airport spending, respectively. The Project will not result in changes that would cause a disproportionate adverse impacts to any communities. See Section 3.2.12, *Socioeconomics, Environmental Justice, and Children's Health and Safety Risks* for additional information.
	Land Use	No	This category is not included because all proposed work is within the existing Airport footprint on land that is currently paved, in aviation or transportation-related use, and compatible with existing land uses.
	Department of Transportation Act, Section 4(f)	No	This category is not included because there are no Section 4(f) properties within the Airport or Project footprint.
	Visual Effects (including Light Emissions)	No	This category is not included because the existing visual character of the area will remain the same; the site and surrounding land will remain in airport-use. The terminal buildings, central garage and roadways separate residents from the Project Area, which is entirely on-Airport. Due to the configuration of the roadways and other existing on-Airport buildings, the proposed canopy and roadway changes would not be highly visible from nearby residential communities.
	Farmlands[4]	No	This category is not included because no farmlands of statewide importance, as defined by the Farmland Protection Policy Act, exist within the Airport boundaries or within the vicinity of the Airport.[4] This resource is not applicable to the Project and is, therefore, not discussed in the narrative.
	Biological Resources (including fish, wildlife, and plants)	No	This category is not included because no biological resources are present within the Project Area. All Project elements are outside state Priority Habitats near the Airport. This resource is not applicable to the Project and is, therefore, not discussed in the narrative.

1 Environmental resource categories as specified in FAA *Orders 1050.1F* and *5050.4B*.
2 Federal Emergency Management Agency (FEMA) flood insurance mapping.
3 As defined by the Wild and Scenic Rivers Act of 1968, 16 U.S.C. section 1271 et seq.
4 United States Department of Agriculture. 1981. Farmland Protection Policy Act (7 U.S.C. 4201-4209).

This EA evaluates the applicable impact categories listed in **Table 3-1**. These categories are discussed in order of relevance to the Proposed Action.

This Affected Environment chapter focuses on the Terminal C Canopy, Connector, and Roadway Project, not the entirety of Logan Airport and its operations. In addition to project-specific cumulative impacts addressed in this EA, airport-wide cumulative impacts will continue to be addressed through the Logan Airport ESPR and

EDR. Thus, the *Logan Airport 2016 Environmental Data Report*,[3] which provides a detailed assessment of Airport-wide conditions at Logan Airport in 2016, informs the overall Airport conditions, while this EA is specific to the Project. The analysis year for the Affected Environment documentation is primarily 2017, the year for which the most complete information is available, unless otherwise noted.

3.2.3 Surface Transportation

This section describes the roadway network within the Transportation Study Area in accordance with FAA *Order 1050.1F* and FAA *Order 5050.4B* paragraph 706(e). The FAA requires surface transportation to be considered when the Proposed Project has the potential to disrupt traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities. Airport-wide ground transportation conditions are documented annually in Massport's EDR/ESPR filings.

Project Area Surface Transportation System

Logan Airport is proximate to downtown Boston and is accessible by two public transit lines (the Massachusetts Bay Transportation Authority's [MBTA's] Blue and Silver Lines) and a well-connected regional and interstate roadway system. Major gateways serving as Airport access points include Route 1A, the Ted Williams Tunnel (Interstate 90), the Sumner/Callahan Tunnels, Frankfort Street/Neptune Road, and Maverick Street, which is gated to limit traffic to East Boston residents only (see **Figure 3-1**).

3 Massport. 2018. *Boston-Logan International Airport 2016 Environmental Data Report*. May 15, 2018.

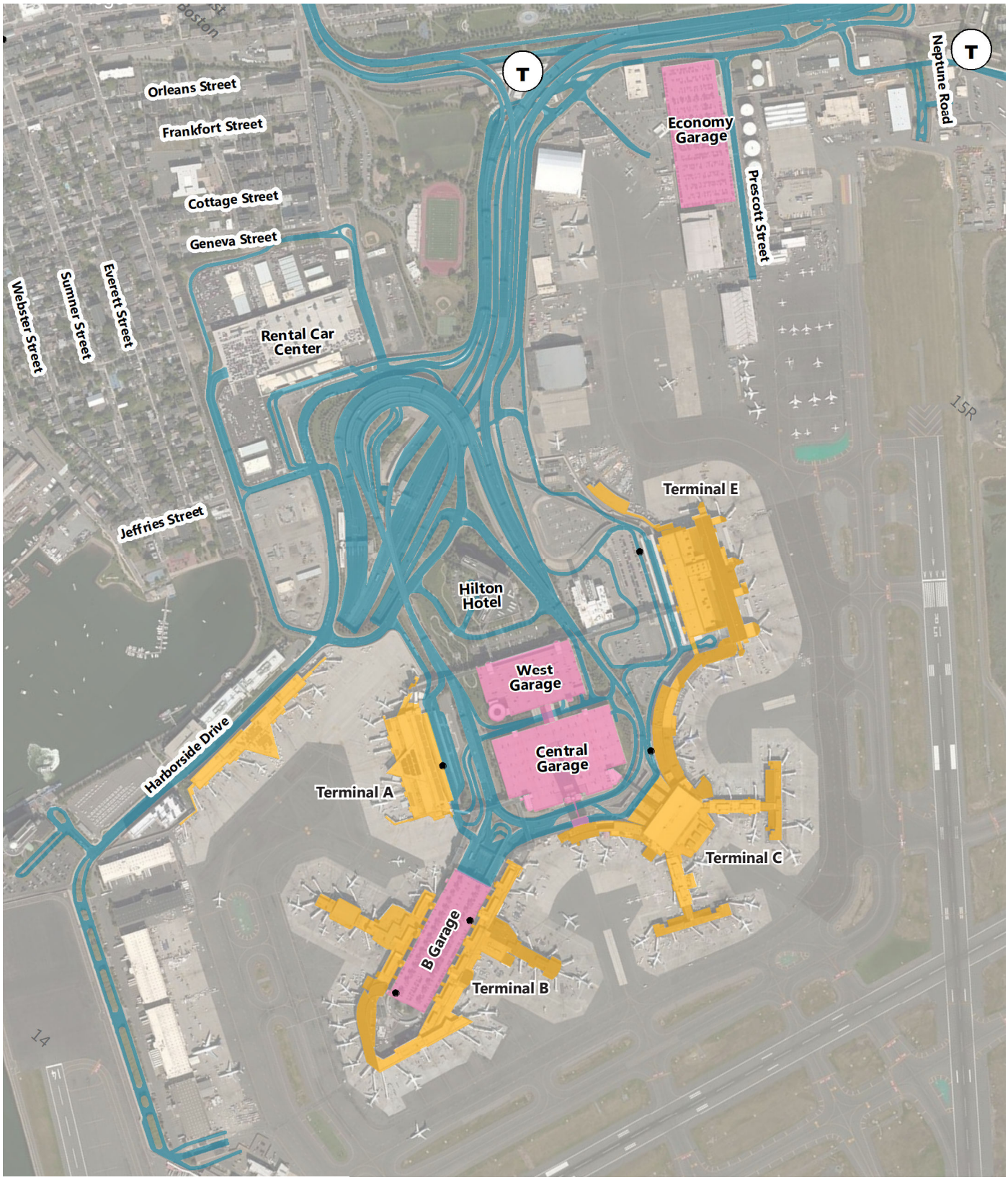

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FIGURE 3-1 Logan Airport Roadway Network

Terminal C Canopy, Connector, and Roadway Project

Terminal Building
Parking Garage
Airport Roadway

massport

Source: Bing Aerial 2016

The Airport is also served by several pedestrian and bicycle connections. Sidewalks along Harborside Drive and Hotel Drive connect to the terminals, where a series of overhead and enclosed walkways connect to the Central and West parking garages, as well as the Hilton hotel. The sidewalks along Harborside Drive, Transportation Way, North Service Road, Maverick Street, and the Harborwalk facilitate pedestrian access to the Airport water shuttle boat dock, the MBTA Blue Line Airport Station, and the pedestrian and bicycle pathways at Memorial Stadium Park, Bremen Street Park, and the East Boston Greenway, which provide more regional bicycle connections. From the MBTA Airport Station, passengers arrive at Terminals C and B by way of free Massport shuttle bus service.

Since the mid-1970s, Massport has committed to increasing use of high-occupancy vehicle (HOV) ground transportation modes for traveling to and from Logan Airport. Massport programs encourage the use of various high-occupancy modes, including public transit, water taxis, and Logan Express bus service. Vehicle access in the terminal areas is focused on furthering this commitment by allocating a large portion of existing terminal curbside space for high-occupancy vehicles. Pedestrian access within and between the terminals is provided by a combination of marked crosswalks with flashing beacons, overhead walkways, and internal terminal walkways.

Terminal C Roadway Infrastructure

The Terminal C roadway infrastructure and curbside configuration is described in this section. The bi-level terminal area roadway system provides direct access to the Departures (upper) and Arrivals (lower) Level curbsides of Terminal C for both private and public transit vehicles. On the Departures Level, ingress and egress are allowed via single-lane entry and exit points on either end of the upper deck. Limousines and HOV have a dedicated outer curb. All other passengers are dropped off on the inside curb. On the Arrivals Level, ingress to Terminal C is allowed via the Terminal B/C connector, the taxi/HOV entrance, and the passenger car entrance, which leads to two independent passenger car curbsides (it was observed that roughly two-thirds of vehicles utilized curb 3). Drivers choose their ingress point based on the type of vehicle they are driving and each entrance leads to the appropriate curbside. Congestion on one of the passenger curbsides (curb 3) can lead to blocked access to the other (curb 4). Egress points are available directly to the Terminal Area Roadways (TAR), or via Terminal E. Parking for Terminal C is provided in the Central and Economy Parking Garages, with pedestrian bridges connecting the Central Garage directly to the terminal. Shuttle service is provided from the Economy Garage.

Massport's Ground Transportation Unit, in conjunction with the Massachusetts State Police, manages the operation and regulation of ground transportation services. The following list of curbside users demonstrates the wide variety of ground transportation modes serviced by the Terminal C curbsides (both Departures and Arrivals Levels unless otherwise noted):

- Logan Express bus service from four locations in the surrounding Boston metropolitan area (Framingham, Braintree, Woburn, and Peabody) and from downtown Boston (Back Bay);
- Rental Car and MBTA Blue Line Shuttle;
- Off-Airport Parking Shuttle Buses;
- Route 11: Massport Inter-terminal Shuttle Bus (Arrivals Level only);
- Route 33: Rental Car Center and Airport Station (Blue Line) – Terminals C & E Shuttle Bus;

- Route 55: Rental Car Center and Airport Station (Blue Line) – All Terminals Shuttle Bus;
- Route 66: Massport Water Transportation Dock, Airport Station (Blue Line), and Logan Office Center – All Terminal Shuttle Bus (Arrivals Level only);
- Route 77: Massport Off-Airport Employee Parking - All Terminals Shuttle Bus (Departures Level only); and
- Route 88: Massport Economy Parking - All Terminals Shuttle Bus (Arrivals Level only).
- Private passenger cars;
- Limousines (Departures Level only);
- Taxis;
- Transportation Network Companies (Arrivals Level Only near Terminal C, Pier A; commonly referred to as the Badge Lot in front of former Terminal D);
- Massport courtesy shuttle buses;
- Charter Buses;
- Scheduled Transit Buses – Peter Pan, P&B, Concord Coach, Vermont Transit, C&J Dartmouth Coach;
- MBTA Silver Line SL1 (Arrivals Level only);
- MBTA Blue Line rail rapid transit service is provided at Airport Station adjacent to Terminal E. Massport shuttle bus Routes 33 and 55 provide connections between Airport Station and Terminal C;
- MBTA local bus Route 171 and express bus Routes 448, 449, and 459 provide service directly to/from Terminal C;
- Shared Van services;
- Hotel Courtesy and off-Airport parking Shuttle Buses;

Given the compact layout of the Airport, roadway configuration, and proximity of terminals to one another, queues at one terminal have the potential to result in traffic congestion at other terminals.

Surface Transportation Traffic Methodology

To verify the existing curb conditions at Terminal C and establish a baseline for comparison to future conditions, an analysis of curbside operations was performed using the Quick Analysis Tool for Airport Roadways (QATAR) spreadsheet model.[4] Based on existing peak hour vehicle demands for each curbside zone, QATAR calculates a curbside zone utilization and level of service (LOS) as well as double and triple parking impacts on the adjacent roadway lanes. LOS is a measure used to rate how well the curbside zone is operating, with a rating of "LOS A" reflective of excellent operations and a rating of "LOS F" reflective of failing operations and substantial curbside congestion. Peak hourly arriving and departing passenger flows by each travel mode were developed using the hourly passenger numbers and mode split percentages from Massport's *2016 Logan Airport Air Passenger Ground Access Survey*.

4 LeighFisher, Dowling Associates Inc., JD Franz Research Inc., and WILTEC. 2010. *Airport Cooperative Research Program, Report 40*. Transportation Research Board.

Similar to the noise analysis, field observations and traffic data collection were conducted during the peak departure and arrival periods in order to assess existing curbs and roadways congestion and circulation conditions at Terminal C. The type and number of vehicles using the curb, estimated travel speeds, estimated vehicle dwell times, and the extent of double lane activity were observed. This information was used in the development of the QATAR model to help accurately represent existing curbside operations and develop future conditions. The following are key inputs into the QATAR analysis:

- Vehicle Attributes – adjacent roadway volume, vehicle volume (by vehicle type, per hour), vehicle parking length, average dwell time by vehicle type, and propensity to double/triple park.
- Physical Roadway/Curb Attributes – total number of lanes, total number of approach lanes, number of curbside zones including crosswalks, curb length allocated to each zone, and allocation of vehicles to each zone.
- General Adjustment Factors – crosswalk adjustment factor and regional adjustment factor.

To estimate existing Airport-wide and Terminal C specific traffic flow, Massport's on-Airport VISSIM[5] model was used. Specifically, the *2016 EDR* base model was modified to reflect 2017 peak summer, average day conditions at Terminal C and the surrounding Airport roadways. The VISSIM model accounts for a larger on-Airport Transportation Study Area from Lovell Street and the North Cargo Area to Harborside Drive and the South Cargo Area, and includes the Southwest Service Area. The VISSIM model not only estimates vehicle miles traveled associated with curbside activity and parking, but also with Logan Airport ground-side operations (e.g., cargo truck activity, employee vehicular movement), rental car activity, and hotel activity. The model was calibrated to existing evening peak hour volume data to improve the accuracy of the results.

Existing Conditions Traffic

On-Airport existing traffic volumes were developed from a number of available sources, including traffic data collected in May/June 2017, Massport's Automatic Traffic Management System, parking transaction data, taxi dispatch data, and bus headway and schedules. Where necessary, traffic data were seasonally adjusted (grown by 6.3 percent) to represent peak summer conditions. Seasonal adjustments are based on 2017 monthly passenger statistics. Supplemental data from 2015 were also used, where appropriate. Volume data were developed at the following locations:

- Departures Level
  - Entrance to and exit from Terminal B
  - Entrance to and exit from Terminal C
  - Terminal Area Roadway leading to Terminal B, between Terminals B and C, and between Terminals C and E

5 PTV America. (2011). Verkehr In Städen Simulationsmodell- VISSIM version 5.40 [computer software]. Portland, OR.

- Arrivals Level
  - Entrance to and exit from Terminal B
  - Entrance to and exit from Terminal C
  - Terminal Area Roadway leading to Terminal B, between Terminals B and C, and between Terminals C and E
  - Terminal B to C Connector
  - Terminal C to E Connector
  - Entrance to and exit from Terminal B Garage

Roadway Operations

In addition to operations curbside, Massport evaluated roadway operations along the terminal area roads surrounding and within Terminals B and C. As discussed above, Massport's Airport-wide VISSIM model was used to evaluate existing traffic conditions at the Terminals and determine the effects of weaving segments, ramp merge, and ramp diverge areas associated with existing terminal operations for both the Departures and Arrivals Levels. These areas currently operate as follows:

- Under typical peak conditions, Airport roadways experience moderate to heavy congestion between Terminals B and C, particularly on the Departures Level during the morning peak hour. This congestion can extend back to the vicinity of Terminal A during heavy flight days. (Note: weather and operational delays are not considered typical and not included in this analysis.)
- Under typical morning peak conditions, queuing is observed on the Departures Level entry ramp to Terminal C, within Terminal C and on the Departures Level exit ramp from Terminal B.
- Under typical evening peak conditions, queuing is observed along the passenger car curbside within the Terminal C Arrivals Level. Vehicle queuing can extend back to the Arrivals Level Terminal Area Road and effect exiting traffic from Terminal B.
- It is typical that operations within Terminal C will impact operations outside the terminal during peak hours on both the Departures and Arrivals Levels.
- Weaving segments along Terminal Area Roadways between Terminals B and C (both levels) operate at levels of service at or nearing capacity and contribute to exacerbated queuing and safety concerns.

Curbside Operations

The observed peak hour vehicle demand was entered into the QATAR model along with curb dimensional and usage information regarding curbside allocation. The detailed summary of volume development and QATAR analysis output is provided in Appendix B, *Surface Transportation*. **Tables 3-2** and **3-3** summarizes the results. While several curbsides show congestion during peak hours, QATAR's inability to consider choke points such as lane drops, merges, and weaves often result in operational calculations that overstate how well a curbside is functioning.

These results should be considered coincident with the microsimulation calibrated to existing conditions to get a full picture of terminal operations. Based on the findings of the QATAR analysis, the microsimulation, and observations of curbside activity during peak hours, the following is noted:

- Congestion on the departures level effects all curbs at Terminal C. Congestion is limited to the early morning hours, but significantly impacts operations at Terminal C, Terminal B, and the Terminal Area Road as far back as Terminal A. Curbside management becomes difficult and vehicles, especially taxis and limos may use the HOV curb if accessible.
- Congestion on the arrivals level is confined to the private vehicle curbsides. Congestion is sporadic throughout the day, often lasting for a few minutes and effecting the Terminal Area Road between the passenger car entrance and the HOV entrance.

Table 3-2 Summary of Existing Terminal C Curbside Operations: Departures Level

Location	Curbside Demand (Vehicles)	Curbside Length (feet)	Curb Level of Service	Roadway Demand (Vehicles)	Roadway Level of Service
Curb 1[1]					
Passenger Drop-off/Taxis/TNCs	636	240	F	636	F
Curb 2[1]					
Rental Car/MBTA Blue Line Shuttle	10	80	A	74	A
All Other Buses	64	80	D	74	A
Curb 3[2]					
Limousines/Taxis	195	170	D	195	A

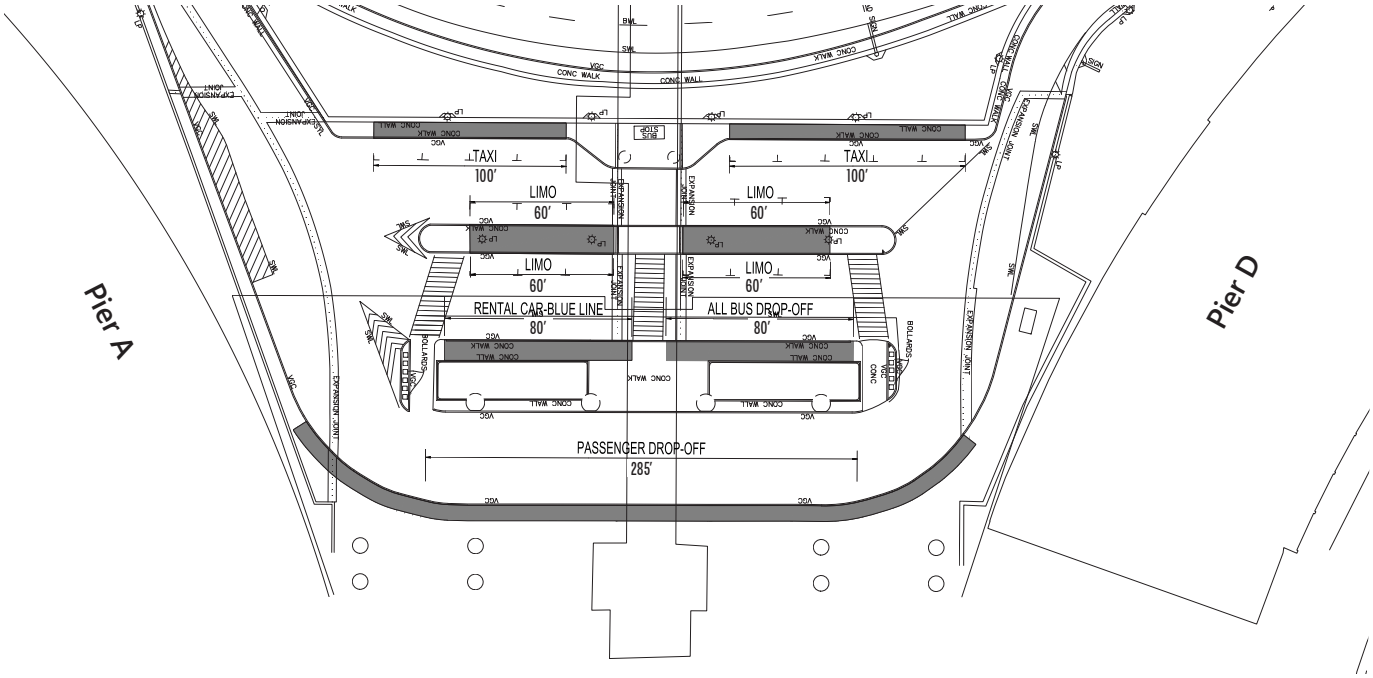
Source: VHB
1 Curbs 1 and 2 have three crosswalk zones, two 12' crosswalks at each end and a 21' crosswalk in the middle.
2 Curb 3 has two 21' crosswalks.

Table 3-3 Summary of Existing Terminal C Curbside Operations: Arrivals Level

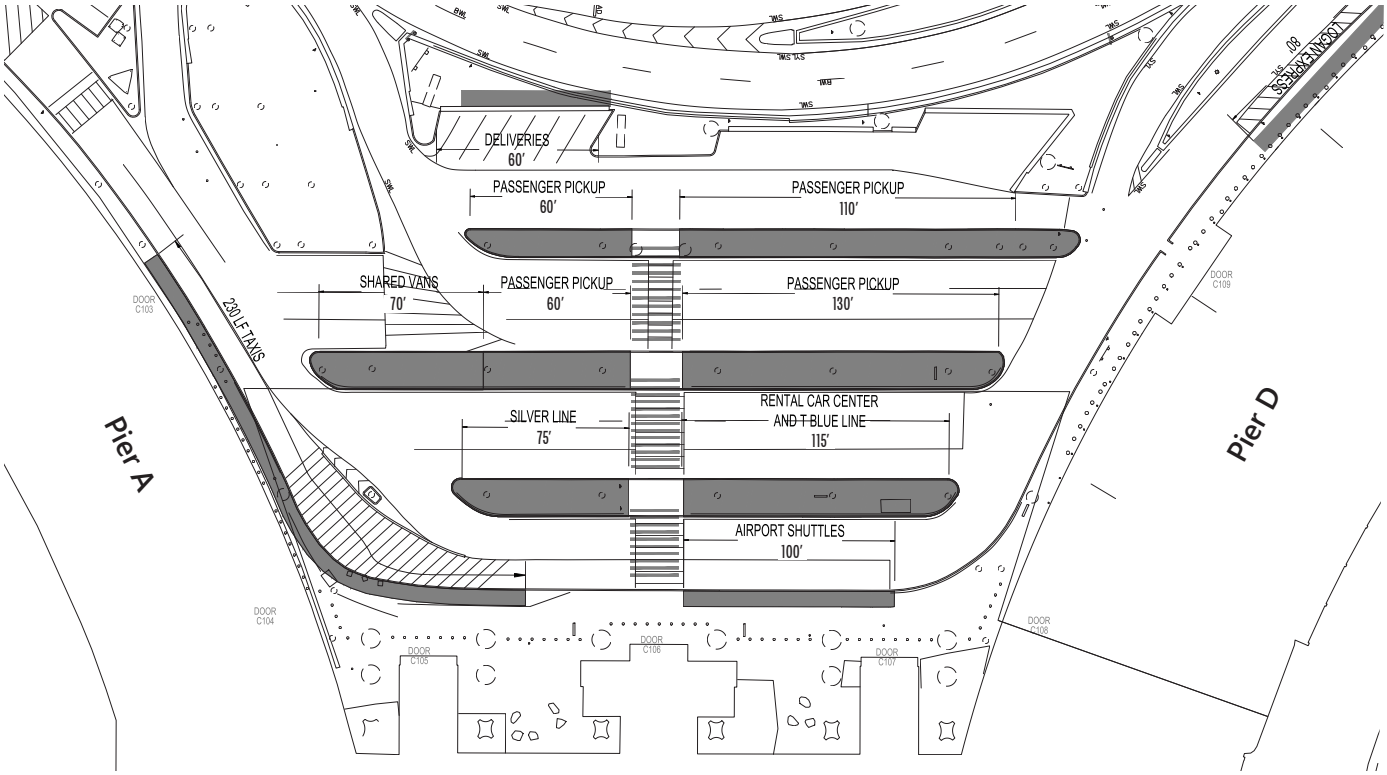
Location	Curbside Demand (Vehicles)	Curbside Length (feet)	Curb Level of Service	Roadway Demand (Vehicles)	Roadway Level of Service
Arrivals Level – Curb 1					
Airport Shuttles	16	100	A	71	A
Taxis	55	230	A	71	A
Arrivals Level – Curb 2					
MBTA Blue Line/Rental Car Shuttle	12	115	A	73	A
MBTA Silver Line	8	75	A	73	A
Arrivals Level – Curb 3					
Shared Van	15	70	A	133	A
Passenger Pick-Up[1]	118	190	E	133	A
Arrivals Level – Curb 4					
Passenger Pick-Up[1]	118	170	D	118	A
Arrivals Level – Terminal D Curb					
Logan Express	10	80	A	104	A
Scheduled Bus Service	10	65	E	104	A
Charter Bus	3	60	A	104	A
Courtesy Bus	30	50	A	104	A

1 Assume 2/3 passenger pick-up vehicles use Curb 3 per observation and anecdotal data; assume ¼ of rental car pick up passengers at curb.

In 2017, Terminal C processed a record number of passengers in 2017 but with only one-half the required curb capacity. This deficiency is most noticeable on the Departures Level during the morning peak hour. Growth in Transportation Networks Companies (TNCs) such as Uber and Lyft are also contributing to increased curb needs. The limited available space at Terminal C creates further challenges with curbside management. The short weaving distance between Terminals B and C (on both levels) combined with the increases discussed above has hastened the need for improvements that can address both a surge in traffic volume and vehicle safety on the terminal area roadways. Existing curbside allocation for the Departures and Arrivals Levels are illustrated in **Figure 3-2**.



Departures / Upper Level



Arrivals / Lower Level

\\vhb\proj\Wat-EVA\14055.00FM-MPA\graphics\FIGURES\Chapter_3_figures102318.indd

FIGURE 3-2 Existing Curb Area

Terminal C Canopy, Connector, and Roadway Project

Existing Curb Area

Source: VHB

3.2.4 Air Quality

According to FAA *Order 1050.1F* and *Order 5050.4B*, the Project proponent must assess whether a project is likely to result in significant impacts to air quality of the human environment. This section describes the regulatory context related to air quality and the Airport-wide air quality conditions at Logan Airport.

3.2.4.1 National Ambient Air Quality Standards

The federal Clean Air Act, the National Ambient Air Quality Standards (NAAQS), and similar state laws govern air quality issues in Massachusetts. The NAAQS and the Massachusetts State Implementation Plan (SIP), promulgated to demonstrate compliance with the Clean Air Act (and its 1990 amendments), regulate air quality issues in the Boston metropolitan area and state, and are discussed in the next section.

The United States Environmental Protection Agency (EPA) established NAAQS for a group of criteria air pollutants to protect public health, the environment, and the quality of life from the detrimental effects of air pollution. These NAAQS are set for the following six pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). The NAAQS primary standards (designed to protect human health) and secondary standards (designed to protect human welfare) are summarized in **Table 3-4**.

Based on air monitoring data and in accordance with the Clean Air Act, all areas within Massachusetts are designated as attainment, nonattainment, maintenance, or unclassifiable with respect to the NAAQS. An area with air quality better than the NAAQS is designated as attainment, an area with air quality worse than the NAAQS is designated as nonattainment, and an area that is in transition from nonattainment to attainment is designated as attainment/maintenance. An area may also be designated as unclassifiable when there is a temporary lack of data to form a basis for determining attainment status. Nonattainment areas can be further classified as extreme, severe, serious, moderate, and marginal by the degree of non-compliance with the NAAQS. The current attainment/nonattainment designations for the Boston metropolitan area are summarized in **Table 3-4**.

In May 2012, EPA issued a Clean Data Finding for the Boston area ruling that the area has attained the 1997 NAAQS, suspending many obligations related to SIP development and implementation so long as the area continues to demonstrate attainment based on ambient data. In June 2013, EPA proposed to revoke the 1997 8-hour NAAQS completely and it was officially revoked in April 2015. The anti-backsliding requirements of the federal Clean Air Act may still obligate the Massachusetts Department of Environmental Protection (MassDEP) to enforce select elements of any federally enforceable SIP prepared to attain the 1997 NAAQS (see **Table 3-5**).

Table 3-4 National Ambient Air Quality Standards

Pollutant	Averaging Time	Standard ppm	Standard µg/m³	Notes
Carbon Monoxide (CO)	1 hour	35	40,000	Not to be exceeded more than once a year.
	8-hour	9	10,000	Not to be exceeded more than once a year.
Lead (Pb)	Rolling 3-Month Average	—	0.15	Not to exceed this level. Final rule October 2008.
	Quarterly	—	1.5	The 1978 standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
Nitrogen Dioxide (NO_2)	1 hour	0.100	188	The three-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm.
	Annual	0.053	100	Not to exceed this level.
Ozone (O_3)	8-hour[1]	0.070	—	Annual fourth-highest daily maximum 8-hour concentration, average over 3 years.
Particulate Matter with a diameter $\leq$ 10µm (PM_{10})	24-hour	—	150	Not to be exceeded more than once a year on average over three years.
Particulate Matter with a diameter $\leq$ 2.5 µm ($PM_{2.5}$)	24-hour	—	35	The three-year average of the 98th percentile for each population-oriented monitor within an area is not to exceed this level.
	Annual (Primary)	—	12	The three-year average of the weighted annual mean from single or multiple monitors within an area is not to exceed this level.
	Annual (Secondary)	—	15	The three-year average of the weighted annual mean from single or multiple monitors within an area is not to exceed this level.
Sulfur Dioxide (SO_2)	1 hour	0.075	196	Final rule signed June 2, 2010. The three-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed this level.
	3-hour	0.5	1,300	Not to be exceeded more than once a year.

Source: EPA, 2016 (https://www.epa.gov/criteria-air-pollutants).
Notes:
1 Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standard additionally remain in effect in some areas. Revocation of the 2008 standard and transitioning to the new standard will be achieved over the next three years.
ppm Parts per million
µg/m³ Micrograms per cubic meter

Table 3-5 Attainment/Nonattainment Designations for the Boston Metropolitan Area

Pollutant	Designation
Carbon Monoxide (CO)	Attainment/Maintenance[1]
Nitrogen Dioxides (NO_2)	Attainment
Ozone (Eight-hour, 1997 Standard- NAAQS Revoked)	Attainment/Maintenance[1]
Ozone (Eight-hour, 2008 Standard)	Attainment
Ozone (Eight-hour, 2015 Standard)	To be determined[3]
Particulate matter (PM_{10})	Attainment
Particulate matter ($PM_{2.5}$)	Attainment
Sulfur Dioxide (SO_2)	Attainment
Lead (Pb)	Attainment

Source: EPA, March 31, 2018 (https://www.epa.gov/green-book).
1 The Boston area was previously designated nonattainment for this pollutant but has since attained compliance with the National Ambient Air Quality Standards (NAAQS) and was designated maintenance for CO in 1996, which is now beyond the 20-year maintenance timeframe. The 1997 standard was revoked in April 2015.
2 Attainment designation will be determined in October 2018.

3.2.4.2 State Implementation Plan (SIP)

A SIP is a state's regulatory plan for bringing nonattainment areas within that state into compliance with the NAAQS. MassDEP is required to submit updated SIPs to the EPA periodically to address the Clean Air Act requirements. The current and future SIPs for the Boston area are summarized in **Table 3-6**.

Table 3-6 State Implementation Plan (SIP) for the Boston Area

Standard	Title	Status	Comments
Carbon Monoxide (CO)	Maintenance Plan	Published in 2018	This Maintenance Plan is required for any area that was formerly designated as non-attainment to show that it will not regress to this status.
Ozone	2008 SIP	Submitted to EPA in 2014	As of April 2018, MassDEP has determined that the Boston area is still compliant with the 2008 standard, thus the SIP status is currently pending.[1]

Source: MassDEP (http://www.mass.gov/eea/agencies/massdep/air/reports/state-implementation-plans.html).
Notes: The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Logan Airport Parking Freeze (310 Code of Massachusetts Regulations 7.30 and 40 CFR 52.1120), which is an element of the Massachusetts State Implementation Plan (SIP) under the Federal Clean Air Act.
1 Certification of Adequacy of the Massachusetts SIP for the 2008 Ozone NAAQS, February 9, 2018.

3.2.4.3 Air Quality Management at Logan Airport

At Logan Airport, Massport has implemented a wide array of initiatives aimed at reducing and minimizing emissions associated with airport activities (including those associated with the existing Terminal C). Select examples include, but are not limited to, alternatively fueled fleets of transit buses and other motor vehicles; a new consolidated rental car facility; pre-conditioned air and 400 Hz power units at aircraft gates to allow aircraft to plug-in rather than operate their on-board auxiliary power units; Leadership in Energy and Environmental Design (LEED®) Certification for new buildings; and solar panels for electrical generation.

3.2.5 Noise and Noise-Compatible Land Use

The noise environment surrounding the Airport has been well documented through the annual EDRs and ESPRs that report on the overall noise levels primarily generated by aircraft on the runways and in flight in the vicinity of Logan Airport. The ESPR documents include future contours, such as the modeled 2030 Day-Night Average Sound Level (DNL) contour published in the *2011 ESPR*.

Massport strives to minimize the noise effects of Airport operations on its neighbors using a variety of noise abatement programs, procedures, and other tools. Logan Airport has an extensive noise abatement program, which includes residential and school sound insulation programs and flight tracks designed to optimize over-water operations (especially during nighttime hours). The foundation of Massport's comprehensive noise abatement program is the *Logan Airport Noise Abatement Rules and Regulations*[6] (the "Noise Rules") which have been in effect since 1986. Almost all of the residences exposed to levels greater than a DNL of 65 decibels (dB) in 2016 have been eligible in the past to participate in Massport's residential sound insulation program (RSIP).

FAA *Orders 1050.1F* and *5050.4B* determine a significant noise impact to be a DNL increase of 1.5 dB or more at a noise-sensitive location with a DNL of 65 dB or higher. In general, FAA considers DNL 65 dB as the threshold below which all land uses are compatible. The 2016 DNL 65 dB contour encompasses the Terminal C study area. The nearest residential and recreational locations to the Project Area are within the DNL 60 dB contour. In 2016, the estimated overall number of people exposed to DNL values greater than 65 dB was 14,097 people.[7] Within the DNL 70 dB contour the number of people was 430.

This EA evaluates noise levels associated with activities at Terminal C. Future airport-wide noise conditions will continue to be assessed in the forthcoming *2017 ESPR* which will include a forecast of future conditions.

3.2.6 Natural Resources and Energy Supply

Logan Airport is a campus of interconnected buildings, transportation facilities, utility infrastructure, natural environments, and management systems. FAA *Orders 1050.1F* and *5050.4B* require that proposed projects employ principles of environmental design and sustainability. Massport is a national leader in airport sustainability with a two-decade long track record of implementing sustainability initiatives, including the first LEED® terminal in the world. The *2016 EDR* and the *Logan Airport Sustainability Management Plan*[8] provide comprehensive information on Massport's efforts to conserve energy, generate energy from alternative sources, and reduce greenhouse gas emissions, among other successful initiatives.

Massport is making strides in reducing energy use at the Airport. In Fiscal Year (FY) 2017, the year of the most complete available data, Logan Airport consumed approximately 184,433 MWh (megawatt hours) of electricity, about 54 percent of which supplied the terminals. Terminal C consumes about 15 percent of Logan Airport's electricity and 27 percent of the electricity consumed by the terminals. In addition to electricity, Logan Airport also consumes natural gas and heating oil. When accounting for all energy types, including electricity, natural gas, and fuel oil numbers 2 and 6, buildings at Logan Airport consumed 1,180,498 MMBtu (million British thermal units) in FY2017. This represents an energy intensity of 84.1 kBtu (thousand British thermal units) per square foot in FY2017, an about 11 percent reduction from FY2012.[9] In FY2017, onsite renewable energy projects

6 *Logan Airport Noise Abatement Rules and Regulations* are codified at 740 CMR 24.01 et seq.
7 Based on the 2010 Census.
8 Massport. 2015. *Logan Airport Sustainability Management Plan*. https://www.massport.com/media/2397/logansmp_report.pdf. Accessed March 30, 2017.
9 *Sustainable Massport*, Annual Sustainability and Resiliency Report, April 2018.

(non-power purchase agreement projects) at Logan Airport generated 588,275 kWh (kilowatt-hours) of electricity.[10]

3.2.6.1 Sustainability at Logan Airport

Massport is committed to implementing a sustainability program at Logan Airport. Consistent with the Airports Council International - North America's definition of Airport Sustainability,[11] Massport is focused on a holistic approach to managing Logan Airport to ensure economic viability, operational efficiency, natural resource conservation, and social responsibility. Massport is implementing environmentally sustainable practices Authority- and Airport-wide, and continues to make progress on a range of initiatives.

Logan Airport Sustainability Management Plan

In 2013, Massport was awarded a grant by the FAA to prepare a sustainability management plan for Logan Airport. The purpose of the plan is to enhance the efficiency and sustainability of Logan Airport's operations and to support the broader sustainability principles of the Commonwealth of Massachusetts. This planning effort began in May 2013 and was completed in April 2015. The plan, which takes a broad, holistic view of sustainability, promotes and integrates sustainability Airport-wide and coordinates ongoing sustainability efforts across the Authority. The *Logan Airport Sustainability Management Plan* developed a framework and implementation plan, with metrics and targets, designed to track progress over time. Massport reports on its progress in an Annual Sustainability Report, the first of which was published in April 2016 (http://www.massport.com/media/2774/massport-annual-sustainability-and-resiliency-report-2018_lr.pdf).

Sustainability in Planning, Design, and Construction

The U.S. Green Building Council's LEED® rating system is the most widely recognized third-party green building certification system in North America. Massport is striving to achieve LEED® Silver certification or higher for new and substantial rehabilitation of building projects over 20,000 square feet. Some recent examples of LEED® certified buildings at Logan Airport are the Rental Car Center (LEED® Gold) and the Green Bus Depot (LEED® Silver).

For smaller building projects and non-building projects, Massport uses its Sustainable Design Standards and Guidelines to incorporate sustainability into capital improvement projects. These guidelines provide a sustainable building framework for design and construction of both new construction and rehabilitation projects for both building and non-building projects (for example, pavement projects).[12] The guidelines apply to a wide range of project-specific criteria such as site design, project materials, energy management and efficiency, air emissions, water management quality and efficiency, indoor air quality, and occupant comfort.

3.2.7 Climate

Massport has adopted a greenhouse gas management and reduction policy that includes identifying and assessing measures to avoid, minimize, or mitigate greenhouse gas emissions. Massport also has a resiliency program to improve its climate preparedness.

10 *Ibid.*
11 Airport Council International (ACI). *Airport Sustainability: A Holistic Approach to Effective Airport Management.* Undated. http://www.aci-na.org/static/entransit/Sustainability%20White%20Paper.pdf. Accessed April 13, 2018.
12 Massport. *Sustainable Design Standards and Guidelines*. http://www.massport.com/media/1153/sustainabledesign_v2_march2011.pdf. Accessed May 15, 2018.

3.2.7.1 Greenhouse Gas Emissions Inventory

As described above in Section 3.2.4, *Air Quality*, Massport prepares a comprehensive and Airport-wide emissions inventory for Logan Airport annually and publishes the results in the EDRs and ESPRs.[13] In addition to energy consumed by the Terminal C facility, the principal sources of greenhouse gas emissions presently associated with Terminal C are mobile sources including aircraft engines and their auxiliary power units, ground support equipment, and ground access vehicles traveling to, from, and moving about the Airport (these include automobiles such as cars, trucks, and vans; taxis and limousines; step-vans; shuttles; and transit buses). Other, smaller sources of emissions include back-up electrical generators, food-preparation services, and construction activities whenever they occur (See Table 7-11 of the *2016 Boston Logan International EDR* for additional information). However, these sources and their emissions are not segregated from the other facilities or operations reported upon in the EDRs and ESPRs.

3.2.7.2 Resiliency

Massport is a national leader in resiliency planning. As noted on Massport's website,[14] "Changing climate is real and the consequent disruptions (such as increased storms and fluctuations of extreme temperatures) will be more frequent in the future. This requires us to change the way we plan, design, and manage both our built and non-built environment – with the end goal of creating a resilient and sustainable future for ecosystems, human communities, and economic viability." After the Superstorm Sandy event, Massport established a Resiliency Working Group to identify threats and hazards, likely scenarios, and current vulnerabilities.

A high-level evaluation of the resiliency of Massport's facilities to natural (hurricanes, storms, flooding, earthquakes), man-made (fires), and technological (data loss) threats was undertaken. In addition, Massport commissioned the *Disaster and Infrastructure Resiliency Planning Study*, which took a detailed look at resiliency at Logan Airport. The *Disaster and Infrastructure Resiliency Planning Study* assessed critical infrastructure and vulnerabilities that the Airport may face during future climate scenarios. Consideration was given to projected sea level rise, floodproofing,[15] and other environmental factors (e.g., high tide or low tide).

Massport's Resiliency Program has identified several goals including:

- Improve resiliency for overall infrastructure and operations;
- Restore operations during and after disruptive events in a safe and economically viable timeframe;
- Create robust feedback loops that allow new solutions as conditions change;
- Inform operations and policy, and implement design/build decisions, through the application of sound scientific research and principles that consider threats, vulnerabilities, and cost-benefit calculations;
- Become a knowledge-sharing exemplar of a forward-thinking, resilient port authority; and
- Work with key influencers and decision makers to strengthen understanding of the human, national, and economic security implications of extreme weather, changing climate, and man-made threats to Massport's facilities and the region.

13 Boston-Logan Environmental Data Reports are available at www.massport.com/environment/environmental-reporting/.
14 Massport. *Resiliency and Climate Change.* https://www.massport.com/business-with-massport/resiliency/resiliency-and-climate-change/. Accessed April 13, 2018.
15 Massport. *Floodproofing Design Guide*. http://www.massport.com/media/1149/massport-floodproofing-design-guide-revised-april-2015.pdf. Accessed May 15, 2018.

3.2.8 Historical, Architectural, Archaeological, and Cultural Resources

Section 106 of the National Historic Preservation Act of 1966, as amended, requires Federal agencies to consider the effects the Project may have on properties listed in or eligible for inclusion in the National Register of Historic Places. Compliance with Section 106 typically requires consultation with the State Historic Preservation Officer (SHPO) and/or the Tribal Historic Preservation Officer.

In accordance with Section 106 and FAA Order 5050.4B and Order 1050.1F, Massport has conducted research and consulted with the Massachusetts SHPO to identify any sensitive resources within the Project Area and determine whether the Project has the potential to have an adverse effect on historic or cultural resources.

There are no on-Airport historic resources that are currently listed in the National or State Register of Historic Places. One area (the Airport itself) and five individual resources at Logan Airport are included in the Inventory of Historical and Archaeological Assets of the Commonwealth maintained by the Massachusetts SHPO/Massachusetts Historical Commission: General Edward Lawrence Logan International Airport (BOS.K), Control Tower (BOS.59), Eastern Terminal (former Terminal A, since demolished) (BOS.60), Administration Building (BOS.61), Our Lady of the Airways Chapel on the Arrivals Level of Terminal C (BOS.62), and Volpe Terminal (Terminal E) (BOS.63).

3.2.9 Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

The Project Area is located on previously developed land in Airport use and does not include any wetlands or floodplains and is not located near or adjacent to a Wild and Scenic River. Accordingly, this section focuses on the existing conditions for stormwater. For reference purposes, **Figure 3-3** shows the one percent and 0.2 percent flood zones near Logan Airport.

FAA *Order 1050.1F* lists several factors to consider for surface waters, which include an action's potential to adversely affect natural and beneficial water resource values, adversely affect surface waters, or create water quality impacts that make obtaining a permit or authorization difficult.

\\vhb\proj\Wat-EV\14055.00FM-MPA\graphics\FIGURES\Chapter-4_figures102318.indd

FIGURE 3-3 2016 FEMA Flood Map

Terminal C Canopy, Connector, and Roadway Project

Select Roadways

AE: 1% Annual Chance of Flooding, with BFE

X: 0.2% Annual Chance of Flooding

Source: Bing Aerial 2016

3.2.9.1 Stormwater

Massport's goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts associated with Airport activities. Massport is responsible for compliance with applicable state and federal environmental laws and regulations. Massport promotes appropriate environmental practices through pollution prevention and remediation measures while working closely with Airport tenants and Airport operations staff to improve compliance. Massport employs several programs to promote awareness of Massport and tenant activities that may impact surface and groundwater quality, thus improving water quality. Programs include implementing best management practices for pollution prevention by Massport, its tenants, and its construction contractors; training staff and tenants; and a comprehensive Stormwater Pollution Prevention Plan.

Massport's environmental programs pertaining to water quality and environmental compliance and management include:

- Stormwater management;
- Water quality management;
- Fuel use and spills reporting and containment;
- Massachusetts Contingency Plan (MCP) compliance;
- Storage tank compliance;
- Compliance auditing and inspections;
- Environmental Management System implementation; and
- Clean State Initiative and Leading by Example Program participation.

The Project Area is adjacent to and drains to Boston Harbor, which is a Category 5 impaired water body.[16, 17]

Logan Airport Storm Drainage System

Logan Airport's storm drainage system consists of a network of stormwater inlets, drainpipes, manholes, and tide gates that make up the 48 independent drainage systems, each with a separate outlet into Boston Harbor. There are five major subsystems serving the terminal and support areas, which include areas of the Airport where refueling, maintenance, and support services occur. The Project Area is served by separate storm and wastewater systems. Within the Terminal C Project Area, one subsystem drains the Project Area. The major storm drainage subsystem within the Project Area is the West Drainage Area. The Project Area, to the west of existing Terminal B, drains to the West Outfall. The West Outfall is equipped with end-of-pipe pollution control equipment that removes debris and floating oil and grease from stormwater prior to discharging into Boston Harbor. The major existing drainage trunk line for this area is located within the Central Garage and also discharges to the West Outfall. An additional drainage line is located within Terminal A, proximate to the project limits.

16 Category 5 water bodies are defined as waters requiring a "total maximum daily load" or TMDL.
17 Massachusetts Department of Environmental Protection. 2015. *Massachusetts Year 2014 Integrated List of Waters.* http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf. Accessed April 13, 2018.

Three existing stormwater pump station are located within the Project Area:

- Within the abandoned Terminal A Egress Tunnel (currently not in operation)
- Near the southwest corner of the Central Garage
- Along the Terminal B arrivals roadway entrance and exit

West Outfall - 002

The drainage area contributing runoff to the West Outfall is approximately 449 acres and includes Terminals A, B, C, and E; the apron and taxiways between Terminals B and C; a portion of the outer taxiway; Taxiways P, E, S, and X; and the cargo areas. The main activities in this drainage area are aircraft fueling, aircraft maintenance at gates, fuel distribution, aircraft lavatory waste management, and during winter months, aircraft deicing and the deicing and sanding of roadways, taxiways, and runways.

Massport currently maintains pollution control equipment at the West Outfall. The pollution control equipment includes a mechanically cleaned bar screen that operates daily in coordination with the outgoing tide and a skimmer that directs materials and water to a grinder pump, followed by a sedimentation tank and oil/water separator. Oil from the separator is pumped out by Massport's contractor and the underflow is circulated back to the outfall upstream of the bar screen. Absorbent floating booms are provided in the skimmer box as well as at each of the outfalls to capture floatables that may have passed through the bar screen and oil/water separator equipment. Solids collected by the bar screens and spent absorbent booms are containerized and disposed of off-site. Conditions at the outfalls and the pollution control equipment are checked weekly and are maintained as necessary.[18]

NPDES Permit and Sampling Requirements

The Clean Water Act requires permits for pollutant discharges into U.S. waters from point sources and for stormwater discharges associated with industrial activities. Massport holds permits under the EPA and National Pollutant Discharge Elimination System (NPDES) Program. The NPDES permit (No. MA0000787) covers Massport and its co-permittees at Logan Airport. It establishes effluent limitations and monitoring requirements for discharges from specified stormwater outfalls.

On July 31, 2007, EPA and MassDEP issued an individual NPDES permit for Logan Airport (NPDES Permit No. MA0000787). The new permit became effective on September 29, 2007, replacing the previous NPDES Permit dated March 1, 1978. The NPDES permit is on EPA's website at https://www3.epa.gov/region1/npdes/logan/pdfs/finalma0000787rtc.pdf. Massport holds a separate NPDES permit for the Fire Training Facility (NPDES Permit No. MA0032751).

The NPDES permit requires grab samples (single samples collected at a particular time and place) to be taken monthly from the North, West, Porter Street, and Maverick Street Outfalls. Samples are tested for pH, oil and grease, total suspended solids, benzene, surfactants, fecal coliform bacteria, and *Enterococcus* bacteria during both wet and dry weather. Grab samples are also taken quarterly from these four outfalls during wet weather to test for eight different polycyclic aromatic hydrocarbons. Additional sampling requirements of the NPDES permit include sampling for deicing compounds twice during the deicing season (October through April) at the North, West, and Porter Street Outfalls. The NPDES permit sets discharge limitations for pH, oil and grease, and

18 Massport Dec 2015. *Logan Airport Operations Stormwater Pollution Prevention Plan.*

total suspended solids from the North, West, and Maverick Street Outfalls and for pH from the Porter Street Outfall. The NPDES permit does not include any discharge limitations for the Northwest Outfall, airfield outfalls, or the deicing monitoring, and requires only that the sampling results be reported. The annual EDRs and ESPRs report on the results of this sampling. In 2016, 98.6 percent of samples tested complied with standards.[19] In accordance with the NPDES Permit, Massport inspects the main outfalls on a monthly basis during wet and dry weather, and the airfield outfalls on an annual basis during wet weather.

3.2.10 Hazardous Materials, Solid Waste, and Pollution Prevention

FAA *Order 1050.1F* identifies several factors to consider for a Proposed Project: potential to violate federal, state, tribal, or local laws regarding hazardous materials and/or solid waste, involvement of a contaminated site, potential to produce hazardous waste, potential to generate a quantity of solid waste or exceed local capacity, or potential to adversely affect human health and the environment. This section discusses the potential presence of oil and/or hazardous materials and solid waste in relation to the Proposed Project and considerations for proper management during construction to prevent pollution.

Several state and federal regulatory programs govern the requirements for site remediation, transport of regulated hazardous materials, and potential spills during construction. Based on a search of the EPA online database, there are no National Priority List sites on Logan Airport.

In the Commonwealth of Massachusetts, the management of hazardous substance and petroleum products when released into the environment is generally governed by the MCP also known as 310 CMR 40. Hazardous substances include oil, hazardous material, and hazardous waste and are defined as those substances that may constitute a present or potential threat to human health, safety, welfare, or the environment. When a hazardous substance impacts (or potentially impacts) an environmental medium, then a release (or threat of release) of oil and/or hazardous materials is said to occur. As per the MCP, a "release" is defined as "spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." A threat of release "means a substantial likelihood of a release of oil and/or hazardous materials which requires action to prevent or mitigate damage of health, safety, public welfare or the environment which may result from the release." The MCP defines a "disposal site" as the place or area where an uncontrolled release of oil and/or hazardous materials has come to be located.

In accordance with the MCP process, Massport continues to assess, remediate, and bring to regulatory closure disposal sites. Massport leads the performance of a variety of response actions, including remediation at sites where Massport is the responsible party, where there are multiple responsible parties, and where no responsible party has been identified. Tracking of MCP activity is reported annually by Massport and can be found in the Logan Airport *2016 EDR*.

Numerous other releases have been documented within the greater Logan Airport area for which Massport is not considered the Responsible Party. Several of these disposal sites have been remediated to background levels and are not anticipated to have resulted in residual contamination that would affect the Project, also known as achieving a Class A-1 Response Action Outcome or Permanent Solution with No Conditions. The remaining active and closed disposal sites located within or abutting the Project Area, which are not being managed by Massport, include the following:

19 Massport. 2016. *Boston-Logan International Airport Environmental Data Report*.

- Release Tracking Number 3-16000 was assigned in 1997 to various releases of oil and/or hazardous materials that were discovered during soil and groundwater sampling conducted to facilitate the construction of the Central Artery (I-93)/Tunnel (I-90) Project in Boston undertaken by the Massachusetts Highway Department. A "Close-out Report" was filed for the portion of East Boston that intersects a portion of the Project Area in October 2008 and accepted by the MassDEP. The MassDEP noted that there are certain areas and parcels within the Central Artery (I-93)/Tunnel (I-90) Project Area that are owned by Massport. Soil borings were conducted within the Terminal C Project Area, but the results were not available

3.2.11 Coastal Resources

Logan Airport is located primarily on filled land within Boston Harbor, within the heavily urbanized Boston Harbor Watershed and is entirely located within the designated Coastal Zone of Massachusetts. FAA *Order 1050.1F* identifies several factors to consider for a proposed action: the potential to be inconsistent with the state coastal zone management plan, the potential impact on a coastal barrier resource system unit, the potential impact to coral reef ecosystems, the level of risk to human safety or property, or the potential for adverse impacts to the coastal environment that cannot be mitigated. The Project is currently on fully developed land, which includes paved areas of the airfield and terminals that are already in use for aviation purposes.

3.2.12 Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

FAA *Order 1050.1F* requires that a project consider the impacts of the alternatives on "the following broad indicators: economic activity, employment, income, population, housing, public services, and social conditions." Logan Airport is located in the East Boston neighborhood, in Boston Massachusetts. The following section describes the existing socioeconomic conditions, environmental justice considerations, and children's health and safety conditions.

The Airport is a major employer and economic generator for the region, and an economically stabilizing anchor in East Boston. Massport is an affirmative action/equal opportunity employer that is committed to workplace diversity. Logan Airport accounts for 89 percent of all economic impact deriving from Massport airports.[20] This economic output estimate includes payments to vendors and suppliers that are located within areas generally impacted by Massport operations. In 2012, Massport's economic contribution to vendors and suppliers in impacted communities was over $8.0 million and in 2013, it was over $11.7 million. This amount represents a 46.5 percent increase from the amount paid in fiscal year 2012.

3.2.12.1 Socioeconomic Factors

This assessment of socioeconomic conditions near the Project Area considers factors such as population, employment, housing, and public services. Socioeconomic factors provide a context for evaluating whether the Proposed Action's natural or physical environmental effects are interrelated with any economic or social effects. To understand the existing social and economic condition of the surrounding community, Massport assessed social and economic indicators of East Boston. Logan Airport is a primary economic engine for the New

20 Massachusetts Department of Transportation Aeronautics Division. 2014. *Massachusetts Statewide Airport Economic Impact Study Update*.

England region, the state, and the Boston metropolitan area. It supports nearly 95,000 direct and indirect jobs,[21] while generating approximately $13.4 billion per year in total economic activity.[22]

3.2.12.2 Environmental Justice

Environmental justice is the concept of fair treatment and involvement of all communities; the evaluation of "Environmental Justice" communities is to analyze whether a single community would be disproportionately affected by negative environmental consequences.[23] Indicators such as racial minorities, low-income, and language isolation typically define Environmental Justice populations.

The MassGIS Environmental Justice Populations data layer is derived from the 2010 U.S. Census and serves as an initial screening tool for identifying potential Environmental Justice populations. According to the data layer, several census block groups within East Boston fall within Environmental Justice criteria. Communities directly abutting Logan Airport qualify for Environmental Justice consideration as minority populations, low-income populations, and English isolation populations. [24]

East Boston is home to approximately 45,000 residents. East Boston is generally considered a minority community made up of primarily Hispanic or Latino residents. According to the most recently available census information, 58 percent of East Boston residents identify as Hispanic or Latino (of any race) and 42 percent identify as "Not Hispanic or Latino." The majority of the East Boston residents identify as either White only (63 percent) or mixed White and Black (or African) (22 percent).

3.2.12.3 Children's Health and Safety Risks

The 16,150 households in East Boston support a median household income of approximately $52,000 annually,[25] compared to the $58,500 median household income of the 259,300 households in the larger City of Boston.[26] Of the 9,500 families in East Boston, approximately 16 percent were below the poverty level based on income during the 12 months prior to the American Community Survey. Similarly, 17 percent of the City of Boston's 124,200 families were below the poverty level based on the same metric. East Boston is generally aligned economically with the City of Boston.

21 Massport and Inter*VISTAS*, 2015.
22 Massachusetts Department of Transportation Aeronautics Division. 2014. *Massachusetts Statewide Airport Economic Impact Study Update.*
23 FAA. 2015. *Order 1050.1F: Environmental Impacts: Policies and Procedures*.
24 OLIVER: MassGIS's Online Mapping Tool. http://maps.massgis.state.ma.us/map_ol/oliver.php. Accessed April 13, 2018.
25 U.S. Census Bureau, American Community Survey 5-year estimate (2012-2016) for zip code 02128 (East Boston). Table DP03
26 U.S. Census Bureau, American Community Survey 5-year estimate (2012-2016) for the City of Boston, MA. Table DP03

4

Environmental Consequences and Mitigation

4.1 Introduction

Per the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA) (40 CFR 1500.2(f)), project proponents shall, to the fullest extent possible:

> "Use all practicable means consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions on the quality of the human environment."[1]

In accordance with the NEPA regulations, this chapter documents the potential effects of the Proposed Action/Proposed Project for each applicable environmental resource category, as specified in Federal Aviation Administration (FAA) *Order 1050.1F*,[2] and *Order 5050.4B*[3] and listed in **Table 4-2**. This chapter also evaluates measures that would avoid and/or minimize impacts, including limiting the degree or magnitude of the Proposed Project and its implementation.

This Environmental Assessment (EA) provides an analysis of whether an impact is significant, in accordance with FAA guidance on impact thresholds for significant adverse effects provided in FAA *Order 1050.1F*. The impact thresholds identified in FAA *Order 1050.1F* are discussed in Section 4.2.6, *Significance Thresholds*. Based on the impact analysis presented in this chapter, there are no adverse environmental impacts associated with the Proposed Project.

This EA also discusses cumulative impacts of the Proposed Project as it relates to other ongoing airport projects. Massport addresses airport-wide cumulative impacts through its Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs); and those documents are included herein by reference. Section 4.2.5, *Cumulative Impacts*, provides more information on the EDRs/ESPRs.

1 Council on Environmental Quality, Regulations for Implementing the National Environmental Policy Act (40 CFR 1500), http://ceq.hss.doe.gov/nepa/regs/ceq/toc_ceq.htm.
2 FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, released July 16, 2015.
3 FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, released April 28, 2006

Based on FAA *Order 1050.1F* and *Order 5050.4B*, the categories evaluates in this chapter include:

- Surface Transportation (Section 4.3.1);
- Air Quality (Section 4.3.2);
- Noise and Noise-Compatible Land Use (Section 4.3.3);
- Natural Resources and Energy Supply (Section 4.3.4);
- Climate (Section 4.3.5);
- Historical, Architectural, Archaeological, and Cultural Resources (Section 4.3.6);
- Water Resources (Surface Waters) (Section 4.3.7);
- Hazardous Materials, Solid Waste, and Pollution Prevention (Section 4.3.8);
- Coastal Resources (Section 4.3.9); and
- Socioeconomics, Environmental Justice, and Children's Health and Safety Risks (Section 4.3.10).

As documented in Chapter 3, *Affected Environment*, the following categories are not applicable to the Proposed Project and are not analyzed in this chapter: Land Use; Department of Transportation Act, Section 4(f) Resources; Farmlands; Biological Resources; and Visual Effects.

4.2 Methodology

This section defines the framework for evaluating direct, indirect, temporary construction impacts, and cumulative impacts of the No-Action Alternative and the proposed Terminal C Canopy, Connector, and Roadway Project. Consideration is given to the NEPA significance thresholds to assess impacts.

4.2.1 Analysis Years

In accordance with NEPA, the Proposed Action is compared to the No-Action Alternative in the same analysis year for each environmental impact category to determine the effect (beneficial or adverse) of the alternative. As stated in Chapter 3, *Alternatives and Proposed Action*, the baseline condition is 2016, the year for which the most recent complete set of data is available, and updated to 2017, where available. The Project is scheduled to be complete by 2024, which represents the future build year, and is not anticipated to change Airport-wide passenger and aircraft activity levels. The analysis also evaluates conditions six years after the full opening of the Project (2030), which is the year the 46.5 million annual passengers (MAP) threshold is anticipated.

4.2.2 Direct Impacts

NEPA defines direct impacts as impacts caused by a project that occur at the same place and at the same time. Project proponents must consider such impacts when determining an action's significance. Based on FAA *Order 1050.1F*, examples of direct impacts could include:

- Noise generated by a project or its alternatives that adversely impacts noise-sensitive land uses; and

- The conversion of vegetated land to pavement (impervious surfaces).

4.2.3 Indirect Impacts

Indirect impacts are those impacts that a project could cause later in time or at another location, but are still reasonably foreseeable. Indirect impacts from a project could occur elsewhere on the project site or in nearby neighborhoods. Indirect impacts may include impacts related to changes in noise and/or vibration levels, land use changes, population density or growth rate, and impacts to air and water quality as well as the quality of other natural systems. Induced development of growth would also be considered.

4.2.4 Temporary Construction-Related Impacts

Temporary impacts occur on a short-term basis during construction. Factors that influence the nature and extent of temporary construction impacts include construction methods, duration, materials, and equipment.

The assessment of temporary construction impacts for the Terminal C Canopy, Connector, and Roadway Project includes a qualitative assessment that considers other on-Airport construction activities that are scheduled to coincide with the construction duration. Each environmental resource section of this chapter identifies and assesses key projects and associated impacts during construction of the Project.

4.2.5 Cumulative Impacts

FAA's NEPA regulations describe cumulative impacts as the incremental impact of a proposed project when added to the past, present, and reasonably foreseeable future projects undertaken by any agency or person.

Boston Logan International Airport (Logan Airport or the Airport) is a dynamic facility that must respond to the changing needs of the airline industry, the regulatory environment, and the traveling public, as well as regional socioeconomic trends. The sections that follow describe the major past, present, and reasonably foreseeable projects within the project Area.

For nearly three decades, Massport has had in place an industry-leading state environmental review process that assesses Logan Airport's cumulative environmental impacts. This public process was developed to provide a context against which individual Airport projects meeting state and federal environmental review thresholds can be evaluated on a project-specific basis. Annually, Massport prepares the Logan Airport EDR, and a more comprehensive Logan Airport ESPR is prepared approximately every five years. The EDRs/ESPRs are reviewed under the Massachusetts Environmental Policy Act (MEPA) process, which includes the opportunity for public comment. The ESPR provides a long-range analysis of projected operations and passengers, while the EDR reviews environmental conditions for the reporting year compared with the previous year. In previous EAs and other NEPA filings, the EDRs/ESPRs have provided the baseline and future assessment of cumulative impacts. As stated earlier in this chapter, the EDR/ESPRs are incorporated herein by reference. The latest EDR and ESPR are posted on Massport's website at: http://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/.

The *2011 ESPR*, filed in early 2013, reported on calendar year 2011 and updated passenger activity levels and aircraft operations forecasts through 2030. The *2016 EDR*, filed in May 2018, provides a

comprehensive, cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operation levels in 2016 and presents environmental management plans for addressing areas of environmental concern. All planned Airport projects, including the Terminal B Optimization Project are described in Chapter 3, *Airport Planning*, of the *2016 EDR*.[4] The following sections summarize the recently completed projects, projects underway, and reasonably foreseeable projects that are considered in the cumulative impact assessment.

4.2.5.1 Recently Completed Projects

Past and recently completed projects at Logan Airport are described in detail in the *2016 EDR*, and include:

- Terminal E Renovation and Enhancements Project;
- Terminal C to E Airside Connector;
- Terminal A to B Landside Connector;
- Runway 4R Light Pier Replacement; and
- West Garage Parking Consolidation.

4.2.5.2 Projects Underway

Terminal B Optimization

Massport is upgrading Terminal B, Pier B, to meet airlines' needs and to enhance the passenger traveling experience. Improvements include an enlarged ticketing hall, improved outbound bag area and claim hall, expanded concession areas, and expanded holdroom capacity at the gate. The project will consolidate American Airlines' operations to one pier of the terminal (now operating on two different sides of the terminal). All Pier B gates will be connected post security and the project will consolidate checkpoint operations for better passenger throughput.

On June 29, 2017, FAA issued a Finding of No Significant Impact (FONSI) on the project. Final design is now complete and construction is underway. Construction is expected to be complete in early 2019.

Runway Incursion Mitigation (RIM) Study

As part of a nationwide safety program, FAA recently initiated a new comprehensive multi-year Runway Incursion Mitigation (RIM) program to identify, prioritize, and develop strategies to help airports across the U.S. enhance airfield safety. Runway incursions occur when an aircraft, vehicle, or person enters an airport's designated area for aircraft landings and take-offs. Risk factors may include unclear taxiway markings, airport signage, and more complex issues such as runway or taxiway layout. Massport is working with the FAA to complete a RIM Study and Comprehensive Airfield Geometry Analysis at Logan Airport to identify areas that need to be addressed and plan for the implementation of safety measures. The study commenced in December 2016 and is expected to be completed by December 2018. It

4 *Boston-Logan International Airport 2016 EDR. http://www.massport.com/logan-airport/about-logan/environmental-reports/.* Accessed May 30, 2018.

is not expected that construction of the proposed Terminal C Canopy, Connector, and Roadway Project would preclude any such safety improvements and no other cumulative impacts are anticipated.

Terminal E Modernization Project

The Terminal E Modernization Project will add the three gates approved in 1996 as part of the International Gateway West Concourse project (EEA # 9791), but never constructed, and an additional four gates to Terminal E. The facility is planned to be constructed in two phases: Phase 1 will add four gates and Phase 2 will add three gates. The building will be aligned to function as a noise barrier. New passenger handling and passenger holdrooms are being planned, as well as possible additional Federal Inspection Services and Customs and Border Protection facilities to supplement the existing Federal Inspection Services areas in Terminal E. The Terminal E Modernization Project will occupy a portion of the North Cargo Area and will include terminal gates, aircraft parking, hangars, and cargo facilities. Portions of the North Cargo Area will continue to be used for economy parking. The project is in the design phase and initial construction on Phase 1 will begin in spring of 2019.

As part of Phase 2, a connection between Terminal E and the Massachusetts Bay Transportation Authority (MBTA) Blue Line Airport Station will be constructed to improve passenger convenience. This connection is currently being studied and various approaches are under consideration. Consideration is being given to constructing an Automated People Mover (APM) which ultimately would connect the MBTA Blue Line Station to all the terminals. The APM concept is in the early stages of feasibility assessment and will be more definitive as the Terminal E Modernization Project moves into Phase 2.

Convenience and Filling Station/Taxi Pool/Transportation Network Company (TNC) Lot Relocations

Construction of the Terminal E Modernization Project, described above, includes the relocation of the existing on-Airport gas station to the intersection of Tomahawk Drive and Jeffries Street on Massport property (Southwest Service Area). The location, chosen by the community-based Logan Impact Advisory Group, provides community benefits such as a convenience space for a local vendor, landscaping and beautification enhancements, and traffic-congestion reductions. It also includes the relocation of the TNC[5] pool to the existing taxi pool at Porter Street to mitigate vehicular congestion along Tomahawk Drive associated with the growing TNC mode. The existing taxi pool lot will be relocated to the Blue Lot between the Logan Office Center and the Hyatt Hotel.

Massport plans to relocate both the TNC and Taxi Pool Lot by the end of 2018, and the project is expected to be completed in 2019 at which time the existing gas station will be demolished.

Terminal B Access Roadway Bridge Construction

This project, which was initially included in the Terminal C Canopy, Connector, and Roadway Project, replaces the existing bridge section that forms a segment of the departures terminal area roadways spanning from the Terminal B entrance to the Terminal C exit. Due to the level of deterioration of the bridge, this project was expedited and is currently under construction.

5 Transportation Network Companies include services such as Uber and Lyft.

4.2.5.3 Reasonably Foreseeable Logan Airport Projects

The impacts of the projects listed in **Table 4-1** have been or will be determined in their respective environmental review processes. The cumulative impacts of the T Terminal C Canopy, Connector, and Roadway Project improvements will be addressed in those upcoming projects' environmental reviews, as applicable, and in the EDRs and ESPRs.

Table 4-1 Reasonably Foreseeable Projects Logan Airport Terminal Area

Project	Construction Period
Automated People Mover Concept Massport is considering several potential options for an Automated People Mover (APM). This APM could provide a connection between all terminals, Southwest Service Area facilities, and other areas on-Airport.	The feasibility of constructing such a system and the operating parameters that would be required are currently being evaluated.
Logan Airport Parking Project As one element of its comprehensive transportation strategy, Massport proposes the phased construction of 5,000 new on-Airport commercial parking spaces at Logan Airport in two locations. As air traveler numbers have increased, the constrained parking supply at Logan Airport, resulting from the Logan Airport Parking Freeze,[6] has had the unintended consequence of causing an increase in environmentally harmful drop-off/pick up trips. The goal of the Logan Airport Parking Project is to reduce the use of drop-off/pick-up modes, which generate up to four vehicle trips instead of two. Massport has identified two potential sites for the new parking spaces. Economy Garage and Terminal E Surface Lot.	In response to Massport's 2016 request to consider an amendment to the Logan Airport Parking Freeze (to increase the commercial parking freeze limit by 5,000 spaces), the Massachusetts Department of Environmental Protection (MassDEP) conducted a stakeholder process, followed by a public process to amend the Logan Airport Parking Freeze regulation. MassDEP issued an amendment to the Logan Airport Parking Freeze regulation on June 30, 2017 approving the requested parking increase. Massport initiated a parallel process with EEA by filing an ENF for new parking facilities on March 31, 2017. A Certificate on the ENF was issued on May 5, 2017, establishing the scope for the required Draft EIR. The Draft EIR will provide additional details on the number of spaces per location and planned construction phasing. Initiation of concept design for the parking facilities is underway.
Terminal A to B Airside Connector As part of the Airport-wide effort to enhance terminal connectivity post-security, a connector between Terminals A and B is under consideration.	The airside connector between Terminals A and B is still being considered, however, this project is not currently in the five-year Capital Program. The landside connection between Terminals A and B was completed in February 2016.

4.2.6 Significance Thresholds

For each applicable environmental resource category, the Terminal C Canopy, Connector, and Roadway Project were compared to the No-Action Alternative in the same year to determine the effect. This section provides an analysis of whether that impact is significant, based on FAA guidance for significant adverse effects provided in FAA *Order 1050.1F*. Significance thresholds identify the minimum attributes and characteristics that need to be present in each resource category (such as noise, water quality, or air quality) for that category to be identified as potentially adversely affected by the action.

Significance thresholds for environmental resources relevant to the Project are summarized in **Table 4-2**. This table excludes those impact categories that the Proposed Project would not affect and/or are not

6 310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120.

present in the Project Area, as discussed in Chapter 4, *Affected Environment*. Measures proposed to avoid, reduce, or minimize the potential impacts are described, if applicable, for each resource category.

Table 4-2 Impact Thresholds for Significant Adverse Effects National Environmental Policy Act (NEPA), FAA *Order 1050.1F* Environmental Resources

EA Section #	Environmental Resource Category	FAA *Order 1050.1F* Threshold for Significant Adverse Impacts
4.3.1	Surface Transportation	Typically addressed in Socio-Economic assessment due to community disruption, however, due to the nature of the project it is discussed in its own section to provide additional detail for this assessment. No established significance threshold.
4.3.2	Air Quality	When an action exceeds one or more of the National Ambient Air Quality Standards (NAAQS), as established by the U.S. Environmental Protection Agency under the Clean Air Act, for any of the times analyzed, or to increase the frequency or severity of any such existing violations.
4.3.3	Noise and Noise-Compatible Land Use	When an action would increase noise by DNL[1] 1.5 decibels (dB) or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No-Action Alternative for the same timeframe.
4.3.4	Natural Resources and Energy Supply	No established significance threshold.
4.3.5	Climate	No established significance threshold.
4.3.6	Historical, Architectural, Archaeological, and Cultural Resources	No established significance threshold.
4.3.7	Water Resources	See specific resources below.
	Surface Waters	When an action exceeds water quality standards established by federal, state, local, and tribal regulatory agencies. When an action contaminates public drinking water supply such that public health may be adversely impacted.
	Groundwater	When an action exceeds groundwater quality standards established by federal, state, local, and tribal regulatory agencies. When an action contaminates an aquifer used for public water supply such that public health may be adversely impacted.
4.3.8	Hazardous Materials, Solid Waste, and Pollution Prevention	No established significance threshold.
4.3.9	Coastal Resources	No established significance threshold.
4.3.10	Socioeconomics, Environmental Justice, and Children's Health and Safety Risks	No established significance threshold.

Source: FAA. 2015. *Order 1050.1F: Environmental Impacts: Policies and Procedures.*
Notes: Excludes environmental resource categories that the No-Action and Proposed Action would not affect and/or those resources that are not present in the Project Area.
1 DNL refers to the Day-Night Average Sound Level, the metric required in FAA *Order 1050.1F* for the consideration of aircraft noise exposure in NEPA documents. The DNL represents the average annual aircraft noise exposure reflecting a cumulative A-weighted sound level over a 24-hour period, including a sound level weighting for aircraft events between 10:00:00 PM and 6:59:59 AM.

4.3 Environmental Consequences

Project-related impacts are described below for each impact category, as listed in **Table 4-2**. The analysis of impacts includes consideration of direct impacts comparing the No-Action Alternative to the Proposed Project. In addition, consideration is given to indirect, construction (temporary), and cumulative impacts. This section also identifies measures that would avoid and/or minimize impacts, where applicable.

4.3.1 Surface Transportation

In accordance with FAA *Order 1050.1F* and FAA *Order 5050.4B* paragraph 706(e), this section describes the roadway network within the Transportation Study Area and the analysis conducted to determine if the Terminal C Canopy, Connector, and Roadway Project generate any potential surface transportation impacts. FAA requires surface transportation be considered when a proposed action has the potential to disrupt traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities. The Proposed Project includes reconfiguration of the roadway network in the vicinity of Terminals B and C and expansion and reallocation of curbside activities on the arrivals and departures levels. The Terminal C Canopy, Connector, and Roadway Project would not result in any off-Airport changes to the roadway system.

Table 4-3 summarizes the potential impacts of the Project on surface transportation. The analysis assesses the impact of the Proposed Project on the level of service (LOS) for intersections, roadways, and curbs. LOS D and above are considered acceptable.

Table 4-3 Summary of Potential Effects of the Terminal C Canopy, Connector, and Roadway Project on Surface Transportation

Area of Impact	Existing Conditions	No-Action Alternative	Terminal C Canopy, Connector, and Roadway Project (Proposed Action)
Terminal Roadway Operations	Poor (LOS F) operations, particularly on departures level during the morning peak hour	LOS degradation at all locations	Improved LOS and safety due to elimination of weave area
Curbside Operations	Departures Level passenger car curb LOS F Taxi Curb LOS D Arrivals Level passenger curbs LOS D and E	Departures Level passenger car curb LOS F Taxi Curb LOS D Arrivals Level passenger curbs LOS D and F	Departures Level all curbs LOS A with active management during peak hours Arrivals Level passenger curbs LOS B and E

Source: VHB

4.3.1.1 Direct Impacts – Surface Transportation

No-Action Alternative

Without the Proposed Project, traffic congestion would continue to grow and delays related to curbside activity would impact passenger ground operations throughout the Airport. Massport maintains an airport-wide microsimulation model of Logan Airport that is updated annually to represent the airport-wide peak hour traffic operations. This microsimulation was refined and calibrated to evaluate conditions occurring at Terminals B and C. The microsimulation analysis of the No-Action Alternative shows that:

- During the evening peak period, there is substantial congestion entering Terminal A on the Departures Level, which frequently causes vehicles to back up onto the Terminal Area Roadways.
- The interaction between Terminal B exiting traffic and Terminal C entering traffic creates a weave condition on the Departure Level and Arrival Level Terminal Area Roadways. During both the morning and evening peak period the weave between terminals causes a back-up, often beyond Terminal B and occasionally beyond Terminal A.
- The Terminal B Departures Level becomes congested along the Pier A (exiting) frontage during both the morning and evening peak periods as vehicles are not able to exit the Terminal due to congestion on the Terminal Area Roadways.
- As the evening peak period ends, the Departures Level Terminal Area Roadway becomes congested due to Terminal E departure traffic and gridlock conditions are projected to affect the gateway entrances to the Airport.

Proposed Action

This section presents the surface transportation traffic assessment as it relates to the effects of the Project with respect to curbside and roadways in the Transportation Study Area. Several analysis conditions are considered and presented below. This section also includes the methodology used to analyze each scenario and the results of the analysis, organized by scenario.

Methodology

This section provides a summary of the methods used to identify the direct impacts related to vehicular traffic at Terminal C curbside and terminal area roads. Methods used for this study follow standard transportation planning industry practices for the evaluation of transportation systems and infrastructure.

Assuming a design year of 2030, terminal area roadway vehicle volumes were developed based on the proposed flight schedule associated with 46.5 million air passengers (46.5 MAP) and anticipated future mode shares for passenger ground access to Logan Airport. Volumes were redistributed with respect to changes in the roadway system and relocation of on-Airport traffic generators related to other ongoing Airport initiatives.

Two standard industry tools were used to analyze roadway and intersection conditions:

- *VISSIM* – Traffic modelling software used to analyze Airport-wide traffic circulation and changes in vehicle miles traveled.
- *QATAR* – Spreadsheet model used to analyze curbside operations.

Analysis Conditions

The Terminal C transportation network was analyzed for the No-Action Alternative and for the Proposed Action, in 2030. The No-Action Alternative assumes minimal changes to the Airport transportation infrastructure, but does include reasonably foreseeable projects of significant scale (as discussed further below).

Based on the review of existing and proposed flight schedules and passenger levels, peak on-Airport travel conditions at Terminal C occur during the weekday morning peak hour on the Departures Level and the weekday evening peak hours on the Arrivals Level. The Airport-wide peak hour (for ground access) also occurs during the evening peak hours. Summer months see the greatest influx of passenger activity. Therefore, the analysis of potential traffic impacts related to the Proposed Action is limited to a typical, peak summer day.

Estimated 2030 vehicular volumes are provided in Appendix B, *Surface Transportation Technical Appendix*. Additional vehicle volumes are distributed throughout the existing roadway network based on existing travel patterns and the anticipated activity of each terminal as identified in the 46.5 MAP flight schedule.

Assumed Roadway/Operations Changes

The No-Action Alternative and the Proposed Action will include modifications to the terminal area roadway network and curbside operations. **Table 4-4** presents the assumed roadway and operational changes used in the analysis of the No-Action Alternative and Proposed Action.

Table 4-4 Assumed Roadway and Operations Changes

Condition	Change
No-Action Alternative	Terminal E Modernization
	Convenience and Filling Station Relocation to SWSA
	Logan Airport Parking Project
	Relocated taxi pool
	Relocated TNC pool and associated Harborside Drive improvements
	Silver Line service to Arrivals and Departures levels[1]
	Increased headways on the Silver Line and Logan Express
	Consolidated concessionary at north and south gates[2]
Terminal C Canopy, Connector, and Roadway Project (Proposed Action)	Eliminate the weaving segments on both levels between Terminals B and C by grade-separating access and egress points
	Reconstruct the Terminal C Departures Level viaduct to provide additional curbside area at Terminal C
	Create new ramps for Terminal B and C traffic
	Create a slip ramp for taxis from the departures terminal area roadway to the Terminal C Arrivals Level
	Create a slip ramp for buses from the Terminal B egress viaduct to the Terminal C Departures deck
	Expand the Departures level curbside to accommodate additional vehicles

Source:VHB

1 Due to existing vertical clearance limits on the Terminal B Departures Level, Silver Line service is only provided on the arrivals Level. The future bus fleet will have lower clearance height and Massport anticipates allowing drop-off activity on the Departures Level.

2 Concession deliveries to individual terminals will no longer be permitted. All deliveries will go through the Airport's north or south gate.

Terminal Area Roadway Impacts

As discussed in Chapter 3, *Alternatives and Proposed Actions*, construction of the Terminal C Canopy, Connector, and Roadway Project includes three elements. The impact analysis presented in the sections below considers the completion of all Proposed Action elements and how they affect operations at all terminals, including those outside of the project limits. An assessment of impacts with the Project shows that:

- While congestion entering the Terminal A Departures Level is still observed, less frequent traffic backs up onto the Terminal Area Roadway are anticipated and congestion in the vicinity of Terminal A is reduced. The analysis assumes restriping of the Terminal Area Roadway and Terminal A entrance to allow for a two-lane entry ramp into the Terminal.
- The ramp redesign removes the weave between Terminal B exiting and Terminal C entering vehicles on the Departure and Arrivals Levels by providing Terminal B an exit ramp which merges with the Terminal Area Roadway after the Terminal C entry ramp. This redesign eliminates congestion related to vehicular weaving and improves traffic safety.

- Terminal B Departures Level exiting traffic is no longer metered by congestion on the Terminal Area Roadway. The ramp redesign allows Terminal B exiting traffic to merge onto the Terminal Area Roadway after the Terminal C entrance ramp.
- Gridlock conditions noted during the evening along the Departures Level Terminal Area Roadway is reduced. This may be a result of removing the weave between Terminals B and C.

Curbside Operations

To analyze curbside operations, the observed and projected peak hour vehicle demands were entered into the QATAR model along with curb dimensions, curb allocation, and usage information. The detailed summary of volume development and QATAR analysis output is provided in Appendix B, *Surface Transportation Technical Appendix*. The Terminal C Departures Level curbside currently operates poorly, with passenger car operations at LOS F during the morning peak hour. Based on the findings of the QATAR analysis, the microsimulation, and observations of curbside activity during existing peak hours, the following is noted:

- Congestion on the departures level effects all curbs at Terminal C. Congestion is limited to the early morning hours, but significantly impacts operations at Terminal C, Terminal B, and the Terminal Area Road as far back as Terminal A. Curbside management becomes difficult and vehicles, especially taxis and limos may use the HOV curb if accessible.
- Congestion on the arrivals level is confined to the private vehicle curbsides. Congestion is sporadic throughout the day, often lasting for a few minutes and effecting the Terminal Area Road between the passenger car entrance and the HOV entrance.

Compared to Existing Conditions, under No-Action Alternative, both the Departures and Arrivals Level curbside and roadway operations would continue to operate poorly but generally the same as they do under the existing condition. As passenger levels increase, passengers shift from one mode of travel to another, and flight schedules are modified, operations along certain curbs are expected to continue to deteriorate. Departures Level Curb 3 operations improve from a LOS D to LOS A as a result of an assumed mode shift from Limos to TNCs, serviced by Curb 3 and Curb 1 respectively. This results in a decrease in Curb 3 curbside demand between Existing to No-Action conditions and contributes to the increase in Curb 1 curbside demand. Passenger pick-up operations on the arrivals level is expected to degrade from LOS E to LOS F. This may be a result of modifications to the flight schedule and shifting of airlines from one terminal to another. There are no curbside allocation changes assumed to occur under the No-Action Alternative. For reference, current/No-Action curbside allocations are provided in Chapter 4.

Table 4-5 Summary of Departures Level Curbside Operations – Existing/2030 No-Action Alternative

	Existing Condition					No-Action Alternative				
Location	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS
Departures Level Curb 1[1]										
Passenger Drop-off/ Taxis/TNCs	636	240	F	636	F	748	240	F	748	F
Departures Level Curb 2[1]										
Rental Car/ MBTA Blue Line Shuttle	10	80	A	74	A	10	80	A	74	A
All Other Buses	64	80	D	74	A	64	80	D	74	A
Departures Level Curb 3[2]										
Limo/Taxis	195	170	D	195	A	140	170	A	140	A

Source: VHB
1 Curbs 1 and 2 have three crosswalk zones, two 12' crosswalks at each end and a 21' crosswalk in the middle.
2 Curb 3 has two 21' crosswalks.

Table 4-6 Summary of Arrivals Level Curbside Operations – Existing/2030 No-Action Alternative

	Existing Condition					No-Action Alternative				
Location	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS
Arrivals Level Curb 1										
Airport Shuttles	16	100	A	71	A	16	100	A	111	A
Taxis	55	230	A	71	A	95	230	A	111	A
Arrivals Level Curb 2										
Rental Car/ MBTA Blue Line Shuttle	12	115	A	73	A	12	115	A	73	A
MBTA Silver Line	8	75	A	73	A	8	75	A	73	A
Arrivals Level Curb 3										
Shared Van	15	70	A	133	A	15	70	A	144	A
Passenger Pick-Up[1]	118	190	E	133	A	129	190	F	144	F
Arrivals Level Curb 4										
Passenger Pick-Up[1]	118	170	D	118	A	129	170	D	129	A
Arrivals Level Former Terminal D Curb										
Logan Express	10	80	A	104	A	10	80	A	104	A
Scheduled Bus Service	10	65	E	104	A	10	65	E	104	A
Charter Bus	3	60	A	104	A	3	60	A	104	A
Courtesy Bus	30	50	A	104	A	30	50	A	104	A

1 Assume 2/3 passenger pick-up vehicles use Curb 3 per observation and anecdotal data; assume ¼ of rental car pick up passengers at curb.

With the Proposed Action, Departures Level LOS for both curbside and roadway operations are expected to improve to LOS A. The curbside will allow for all buses to use curb 1 closest to the door and all other vehicles to share curb space along three other curbs. It is anticipated that curb side management will be required during the peak of Departures Level passenger drop-off to help facilitate efficient operations. Improvements are also expected on the Arrivals Level, where Curb 4 is reconstructed to be more visible and accessible from the Terminal Area Roadways.

Table 4-7 Summary of Departures Level Curbside Operations –2030 No-Action Alternative/ 2030 Proposed Action Alternative

	No-Action Alternative					Proposed Action Alternative				
Location	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS
Departures Level Curb 1[1]										
Passenger Drop-off/ Taxis/TNCs	748	240	F	748	F	N/A	N/A	N/A	N/A	N/A
All Buses	N/A	N/A	N/A	N/A	N/A	74	310	A	74	A
Departures Level Curb 2[1]										
Rental	10	80	A	74	A	N/A	N/A	N/A	N/A	N/A
All Other Buses	64	80	D	74	A	N/A	N/A	N/A	N/A	N/A
Passenger drop-off/ Taxis/ TNCs/ Limos	N/A	N/A	N/A	N/A	N/A	212	210	A	212	A
Departures Level Curb 3[2]										
Limo/Taxis	140	170	A	140	A	N/A	N/A	N/A	N/A	N/A
Passenger drop-off/ Taxis/ TNCs/ Limos	N/A	N/A	N/A	N/A	N/A	279	250	A	279	A
Departures Level Curb 4[3]										
Passenger drop-off/ Taxis/ TNCs/ Limos	N/A	N/A	N/A	N/A	N/A	397	295	A	397	A

Source: VHB
1 Curbs 1 and 2 have three crosswalk zones, two 12' crosswalks at each end and a 21' crosswalk in the middle under No-Action Conditions; a single 20' crosswalk in the middle under the Proposed Action.
2 Curb 3 has two 21' crosswalks under No-Action Conditions; a single 20' crosswalk in the middle under the Proposed Action.
3 Additional general-purpose drop-off curb under Proposed Action
N/A Not applicable

On the Arrivals level, Curbs 1 and 2 operate similarly under the No-Action and Proposed Action alternatives. Curbs 3 and 4 operations improve due to the lengthening (approximately 80 percent) of Curb 4 to support private vehicle passenger pick-up. Private vehicles are assumed to redistribute from Curb 3 to Curb 4 given the added length. As such, the passenger pick-up curb LOS improves on Curbs 3 and 4 from an LOS F (Curb 3) and LOS D (Curb 4) to an LOS E and LOS B between the No-Action and Proposed Action Alternatives, respectively. Additionally, roadway operations on Curb 3 improve from an LOS F to an LOS A from No-Action to Proposed Action alternatives, respectively.

Table 4-8 Summary of Arrivals Level Curbside Operations – 2030 No-Action Alternative/2030 Proposed Action Alternative

	No-Action Alternative					Proposed Action Alternative				
Location	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS	Curbside Demand	Curbside Length (ft)	Curb LOS	Roadway Demand	Roadway LOS
Arrivals Level Curb 1										
Airport Shuttles	16	100	A	111	A	16	100	A	111	A
Taxis	95	230	A	111	A	95	230	A	111	A
Arrivals Level Curb 2										
Rental Car/ MBTA Blue Line Shuttle	12	115	A	73	A	12	110	A	73	A
MBTA Silver Line	8	75	A	73	A	8	110	A	73	A
Arrivals Level Curb 3										
Shared Van	15	70	A	144	A	15	70	A	108	A
Passenger Pick-Up[1]	129	190	F	144	F	93	190	E	108	A
Arrivals Level Curb 4										
Passenger Pick-Up[1]	129	170	D	129	A	165	310	B	165	A
Arrivals Level Former Terminal D Curb										
Logan Express	10	80	A	104	A	10	80	A	104	A
Scheduled Bus	10	65	E	104	A	10	65	E	104	A
Charter Bus	3	60	A	104	A	3	60	A	104	A
Courtesy Bus	30	50	A	104	A	30	50	A	104	A

1 Assume 70% passenger pick-up vehicles use Curb 3 per observation and anecdotal data; assume ¼ of rental car pick up passengers at curb.

4.3.1.2 Indirect Impacts – Surface Transportation

Indirect impacts associated with the Proposed Project are construction-related and expected to be limited in terms of duration. To facilitate construction, Arrivals Level Terminal C curbside operations for passenger cars, taxis, Transportation Network Companies (TNCS – such as Uber or Lyft), and limousines will be temporarily staged in the ground floor of the Central Parking Garage. Additional elevators will be installed in Terminal C to facilitate passenger flow from the terminal building to the garage. During construction of the Departures Level Upper Deck, passenger car, taxi, limousine, and TNC traffic will be sent down to the arrivals level via a new ramp for passenger drop-off and departing passengers will enter the terminal at baggage claim and use elevators/escalators to reach the ticketing area. Arrivals Level pick-up will remain in the garage during this time. High Occupancy Vehicles (HOVs) such as buses and shuttles will not be affected by construction and will continue to drop-off or pick-up as they do under existing conditions throughout construction.

4.3.1.3 Temporary Construction Impacts – Surface Transportation

In accordance with FAA *Order 1050.1F* and *Order 5050.4B*, Massport has analyzed potential construction-related impacts, including surface transportation impacts. Temporary, construction-related impacts occur on a short-term basis during the construction period based on construction methods, duration, materials, and equipment. Construction impacts alone are rarely significant pursuant to NEPA; however, Massport has identified best practices that would minimize the likelihood of negative impacts on the natural and built environments.

The following section provides an overview of the construction methods, equipment, and likely durations for the terminal improvement elements of the Proposed Action.

Construction Phasing

The Proposed Project relies on complex construction phasing in order to facilitate replacement of Terminal Area Roadways while keeping ground access to terminals fully operational. Terminal access during construction to each of the four terminals is anticipated to be as follows:

- **Terminal A**: For approximately one month, the exit ramp from the Arrivals Level will be modified slightly to facilitate egress as utilities are relocated within the footprint of the exit roadway. The Arrivals Level ramp is expected to be fully operational at all times. No other changes to access at Terminal A are anticipated.
- **Terminal B**: Elements of construction will require closure of the existing Terminal B ramp entrances on the Departures and Arrivals Levels, for short periods of time up to one full weekend. Access to the curbside will be provided during this closure. Departures and Arrivals level traffic will likely be routed through the Terminal B garage, requiring closure of the garage for passenger vehicles. Other detour roadways at the Arrivals level will be used to facilitate construction, always maintaining access to the curbside, garage, and between Terminals A and B.

  Exiting vehicles from the Terminal B Departures Level will continue to exit in a similar way that than they do today. Temporary roadway connections will be provided to ensure continuous egress from the Terminal.

  Egress from the Arrivals Level will be through Terminal C (under the Old Tower) during portions of construction (see below for Terminal C implications).
- **Terminal C**: Access and egress on the Arrivals Level of Terminal C is anticipated to be the most impacted throughout the duration of construction. HOV access (all buses and Silver Line), over-height vehicles and deliveries will remain in place on both levels throughout construction with minimal disruption anticipated.

  On the Departures Level, there is a possibility that for portions of construction all passenger, TNC, taxi, and limo will use a new ramp from the Departures level as you enter Terminal C down to the Arrivals Level. Passenger Drop-off will occur on the Arrivals Level and vehicles will then use the existing Arrivals Level Egress to exit the Terminal. This change is required to remove as much traffic as possible in order to complete the Departures Level Upper Deck Expansion.

To facilitate drop-off activity, anticipated construction at the arrivals level curbside, and the use of the Arrivals Level at Terminal C as an access road for exiting Terminal B traffic and entering Terminal E traffic, all Arrivals Level pick-up activity (with the exception of HOV modes) will be relocated to the ground floor of the Central Garage. Upon entering the Arrivals Level Terminal Area Roadway, wayfinding signage will direct private pick-up traffic to a new ramp to enter the Central Garage. Inside the garage, a linear curbside will be provided for awaiting passengers. Taxis, TNCs, and Limousines will enter the garage via a separate gate-controlled ramp from the SR13 roadway. These vehicles will have parking bays and queuing space in an independent location where passengers will be waiting. Passengers will use new elevators (two replacements and one additional) to travel from Terminal C baggage claim up to the pedestrian bridge to the Central Garage and use existing garage elevators to access the ground floor temporary curbside.

- **Terminal E**: There are no anticipated access or egress changes at Terminal C on the Departures Level. On the Arrivals Level, during portions of construction it will be necessary for vehicles entering E to use a temporary access road through the Terminal C Arrivals Curbside. Egress for exiting traffic on the Arrivals Level would remain the same.

Construction Elements

To facilitate construction, the existing boundary of the secure Airport Operating Area would be temporarily adjusted and a Transportation Security Administration (TSA) -approved temporary Security Identification Display Area fence would be constructed. This would allow construction activities to occur outside of secured areas, to avoid airside security issues during the terminal building construction. Construction laydown areas would be located in the construction zone within the approved Security Identification Display Area fence. This is the same TSA-approved procedure that Massport has used for other recent terminal construction projects.

Large construction equipment, major material deliveries, demolition materials, and trash hauling would use the North Gate. Once at the construction site, contractor staff would access the building area through a contractor's construction entrance door/corridor within the terminal. Massport strives to complete all work during daytime hours to avoid construction noise impacts on the surrounding communities. New building foundations would be comprised of deep pilings, pier caps, grade beams, and structural slabs. All superstructure is anticipated to be structural steel. Construction cranes would be used for steel erection and precast panel installation. For roadway and curbside improvements, elevated frontage and exit ramps would be comprised of deep foundations, pier caps, with concrete columns and roadway spans. **Table 4-9** presents the anticipated construction equipment for the Proposed Action.

Table 4-9 – Construction Equipment

Equipment	2018		2019				2020				2021				2022	
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jul-Sep	Oct-Dec
Aerial Lift	4		4	4	7	7	8	8	8	7	1	1		1	1	1
Asphalt Paver	1	1	1	1	1	2	2	2	2	2						
Auger	1		2	2	4	4	3	3	2	1						
Bulldozer	1	1	1	1	2	2	1	1	1	1	1	1		2	2	
Concrete Paver									1	1						
Concrete Pump Truck	1	1	1	1	3	3	3	3	2	2						1
Concrete Transit Mixer	2	1	3	3	5	6	5	5	4	4						1
Crane Mobile	1		2	2	3	5	5	5	4	4	1	1		1	1	1
Dump Trailer	3	3	3	3	6	6	6	6	6	6	1	1	1	1	1	
Dump Truck	3	3	3	3	6	7	6	6	6	6	1	1	1	1	1	
Dumpster	2	1	2	2	6	8	8	8	8	8	1	1	1	2	2	1
Excavator	3	2	3	3	7	8	7	8	8	4	1	1				
Front End Loader		2	2	2	3	3	3	4	4	3	1	1				
Material Handler	1	1	1	1	2	2	2	3	3	2			1	1		
Pile Vibrator			1	1	2	2	1	1	1		1	1				
Roller Dirt	1	1	1	1	2	3	2	2	3	2	1	1				
Roller Pavement	1	1	1	1	1	2	2	2	2	2	1	1				
Sweeper	1	1	1	1	3	2	2	2	2	2	1	1				
Truck and High Bed Trailer	3	1	3	3	4	6	6	6	6	6						
Utility truck	4	4	8	8	10	15	14	14	14	12	1	1	1	1		
Vibratory Plate Compactor		2			1	1										
Water Pump	1		1	1	3	3	2	2	2	1						
Water Truck	1		1	1	3	3	2	2	2	1						
Welding Machine	2	2	4	4	5	9	9	8	8	8						1
TOTAL	37	28	50	50	90	110	100	102	105	85	13	13	5	10	8	6

Source: Caminiti Consulting Corp and Stantec

During construction there would be limited short-term impacts from added vehicle trips to and from the site by construction equipment, fugitive dust, and noise. Demolition materials and other routine construction wastes would be appropriately recycled and disposed.

Coordination with Other Construction Activities

The projects presented in **Table 4-10** are anticipated to be ongoing during construction of the Terminal C Canopy, Connector, and Roadway Project. They are discussed in detail in section 4.2.5 of this chapter.

Table 4-10 Ongoing and Foreseeable Logan Airport Projects

Project	Construction Period	Peak Construction Quarters	Peak Equipment Usage (trucks, dozers, etc.)
Terminal E Modernization Project Phase 1	2020	TBD	TBD
Convenience/Filling Station relocation	2018/2019	TBD	TBD
Logan Airport Parking Project	2020	TBD	TBD

Source: Massport
NA Not Available

Due to the minimal impact of the Proposed Project construction on the roadways and the location of the other construction activities in different areas of the Airport (SWSA and airside), the concurrent construction of these projects can be adequately accommodated by the Airport and regional roadway systems.

Construction Surface Transportation Impacts

Short-term construction impacts are expected to be limited to the roadways that provide direct access to the Airport's entrances (Service Road, Frankfurt Street, and Prescott Street) and on-Airport roadways (Transportation Way, Harborside Drive, and Terminal Area roadways). As documented in Massport's construction management specifications, construction vehicles are restricted from using local roads.

Project construction would be primarily undertaken from a defined work area. All materials and workers would be delivered to the Terminal C construction area with secure escort from the North Gate. Materials to be delivered by truck to the Airport would primarily include asphalt pavement, concrete, granular base and sub base materials, structural steel, Mechanical/Electrical/Plumbing equipment, terminal fit-out/furnishings, and miscellaneous metals. Construction workers would not be allowed to drive or park at the Airport (with the exception of limited supervisory personnel). The majority of workers would be transported to the site by shuttle bus from a remote contractor lot or arrive on existing Airport shuttles.

Construction Traffic Methodology

The estimated numbers of pieces of construction equipment associated with the construction schedule are provided in **Table 4-9** for each quarter from 2018 through 2022. Estimates of the types and numbers of pieces of heavy equipment required for the Terminal C Canopy, Connector, and Roadway Project construction per work shift were developed based on these equipment schedules.

Construction Truck Traffic

Peak construction activity related to the Terminal C Canopy, Connector, and Roadway Project elements occurs at different times. The combined peak is anticipated to occur from July to September 2020. The construction equipment schedules indicate that a maximum of 105 pieces of construction equipment would be required each day during the peak period of construction.

Most of the heavy construction equipment, including some mobile cranes, excavators, concrete pump trucks, pavers, and miscellaneous equipment (welders, compressors, vibro-compactors) would be stored

on the Airport during non-work hours. This equipment would be used during most workdays; however, this equipment would not enter or leave the Airport as a daily construction trip. The following types of equipment would enter and leave the Airport for each work shift:

- Concrete Transit Mixers;
- Dump Trucks;
- Dump Trailers;
- Truck/High-bed Trailers
- Utility Trucks; and
- Water Trucks.

The projected daily need for these types of heavy and light trucks was used to estimate the daily number of total truck trips (arrivals plus departures) to the Airport, as presented in **Table 4-11**. Cumulatively, the Proposed Action construction would generate approximately six to 86 total truck trips per weekday, depending on the Project phase. Construction is expected to take place primarily during the day shift, approximately 7:00 AM to 7:00 PM. Most light duty trucks, such as escort trucks and pick-up trucks associated with supervisory workers, are assumed to all arrive to the Project Area during the morning peak hour and exit during the evening peak hour.

Table 4-11 Total Daily Construction Trips

Year	2018		2019				2020				2021				2022	
Period	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
Total Daily Trips	32	24	42	42	68	86	78	78	76	70	6	6	6	6	4	2

Source: Caminiti Consulting Corp and Stantec

Construction Truck Routes

Massport requires that the contractor use direct construction truck traffic access to Terminal C and that all airside construction sites be through the Airport's North Gate for the duration of construction. Airport access by the contractor would be limited to federal or state highways and segments of local roadways that provide direct access to the Airport's entrances. As noted previously, construction vehicles are restricted from using local roadways through East Boston. Truck trips directly to the Project Area are anticipated to come from all directions and would be routed in any of the following ways (**Figure 4-1**):

- Access via McClellan Highway (Route 1A) southbound, Transportation Way, Hotel Drive, Service Road (SR-2), and Prescott Street; egress via Prescott Street, SR-2, and the Airport Exit ramp from Terminal E to Route 1A northbound.
- Access via Callahan Tunnel, Route 1A Northbound, Frankfort Street off-ramp, Frankfort Street southbound and Prescott Street; egress via Prescott Street, SR-2, the Airport Exit ramp from Terminal E, Route 1A Southbound to the Sumner Tunnel.

- Access via Ted Williams Tunnel, Ramp T-S, Hotel Drive, SR-2 and Prescott Street; Egress via Prescott Street, SR-2, and the Airport Exit ramp from Terminal E to Ted Williams Tunnel.

Construction Traffic Management

Vehicular traffic flow on the Airport roadway network during construction would be managed to maintain acceptable levels of service. If necessary, Massport has the ability to modify contractor schedules and access routes to minimize impacts.

Based on the maximum of 86 total daily construction truck trips and the access restrictions described above, the Terminal C Canopy, Connector, and Roadway Project would have minimal impact on Airport or regional roadways. The Airport roadway infrastructure accommodates over 120,000 daily trips each weekday and can accommodate the anticipated 86 additional daily construction truck trips associated with the Proposed Action's construction without further impacting capacity or delay. Due to the minimal impact of the Proposed Action's construction on the roadways and considering other construction activities (shown in **Table 4-10**) in different areas of the Airport, the concurrent construction of the other ongoing and reasonably foreseeable projects can be adequately accommodated by the Airport and regional roadway systems.

4.3.1.4 Mitigation/Beneficial Measures – Surface Transportation

Construction Traffic Mitigation

The Airport roadways can support the anticipated construction-related traffic; therefore, no specific mitigation is proposed and no Project-specific transportation access plan is proposed. Massport requires all contractors to limit construction-related traffic to access and egress through the North Gate using only state and federal highways and the Airport roadway network, prohibiting construction-related traffic on the local East Boston roadways.

Massport requires contractors to implement construction worker vehicle trip management, including requiring off-Airport parking and high-occupancy vehicle transportation modes for employees.

Construction Traffic Maintenance

Vehicular traffic flow on the Airport roadway network during construction will be managed to maintain acceptable levels of service. If necessary, Massport can modify contractor schedules and access routes to minimize impacts.

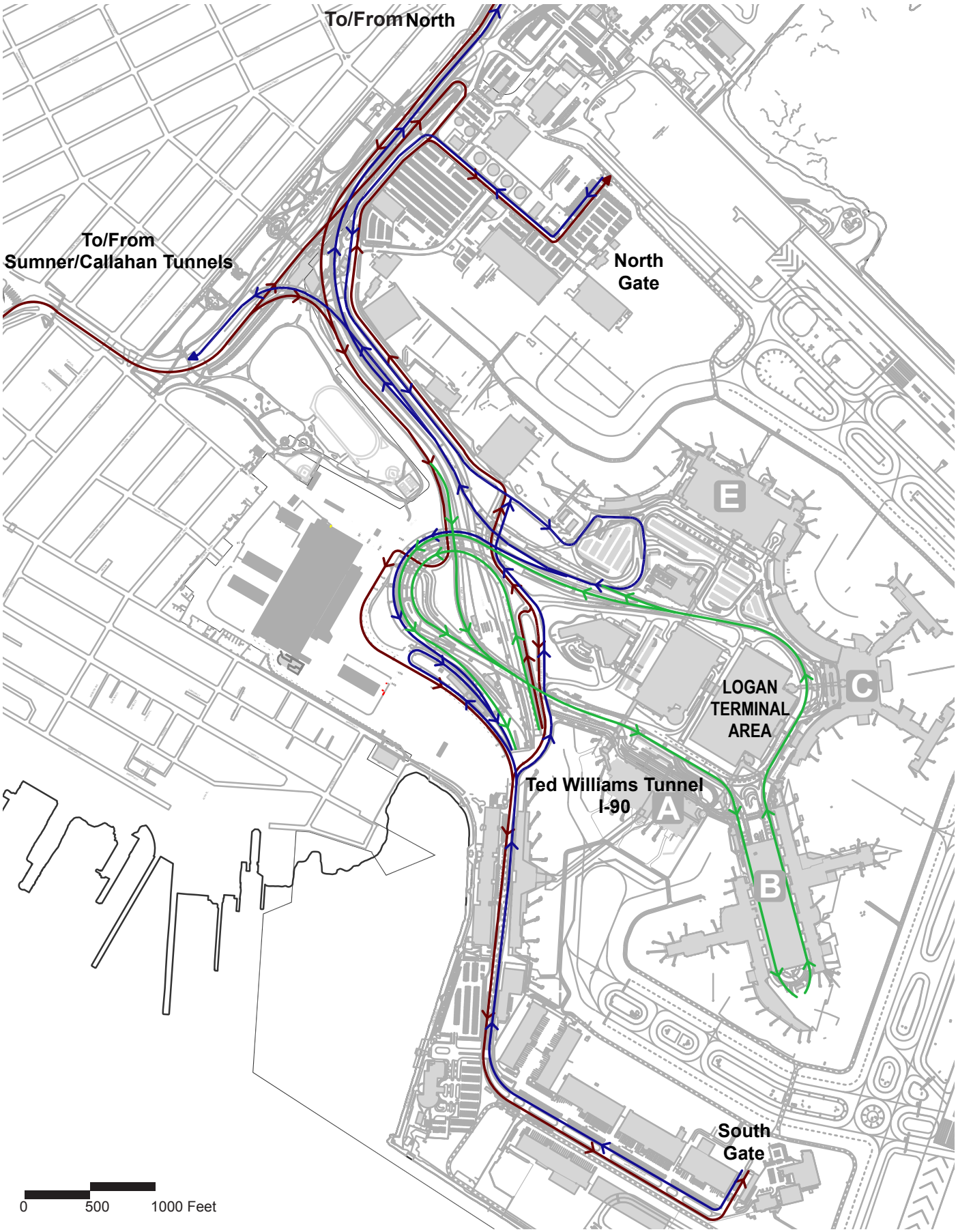


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FIGURE 4-1 Temporary Construction Access/Egress Routes

Terminal C Canopy, Connector, and Roadway Project

Legend

- Access Routes
- Egress Routes
- Small Vehicle Contractor Access

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4.3.1.5 Cumulative Impacts – Surface Transportation

The transportation analysis is, by nature, cumulative because it takes into consideration background and current conditions as well as future actions.

4.3.2 Air Quality

Air quality is evaluated in terms of changes in mobile and stationary sources associated with the Terminal C Canopy, Connector, and Roadway Project when compared to the No-Action Alternative. As described above, the No-Action Alternative and the Proposed Project would have the same airport-wide aircraft operations and passenger activity levels. The Proposed Project is not expected to increase Airport-related mobile or stationary source emissions compared to the No-Action Alternative. Energy modeling for the proposed new building will be completed as part of the design process. Emissions from construction vehicles and equipment would be substantially below the Federal General Conformity *de minimis* thresholds of 50 tons per year (tpy) of volatile organic compounds (VOC), 50 tpy of nitrogen oxides (NO_x), and 100 tpy of carbon monoxide (CO). Therefore, a Clean Air Act General Conformity Determination is not required.

As discussed in Section 4.3.2, *Air Quality*, NEPA and the federal Clean Air Act are the two primary regulations that apply to assessment of air quality impacts attributable to the Terminal C Canopy, Connector, and Roadway Project. NEPA requires the disclosure of a Proposed Project 's impacts on the human environment, including air quality. The Clean Air Act requires that a Proposed Project do not cause, or contribute to, a violation of the National Ambient Air Quality Standards (NAAQS).

With respect to the NAAQS Attainment/Non-attainment designations for the Boston metropolitan area, Section 4.3.2, *Air Quality*, reports that the area is currently in Attainment for CO, but because of past violations, it is still designated as Attainment/Maintenance for this pollutant. Similarly, although the Boston area now meets the former 8-hour standard for ozone, it is also still subject to the State Implementation Plan (SIP) for this pollutant under the "Anti-Backsliding"[7] provision of the Clean Air Act. Importantly, VOCs and NO_x are used as surrogates for ozone as this pollutant is formed from these precursors.

Because of these designations, projects and actions involving federal agencies (including FAA) must demonstrate compliance with the General Conformity Rule of the Clean Air Act. This is achieved when project-related emissions are within prescribed numerical thresholds (called *de minimis* levels) indicating that violations of the NAAQS are not expected and compliance with the SIP is assured. The Boston metropolitan area is in Attainment for the other five criteria pollutants including lead, SO_2, NO_2 and $PM_{10/2.5}$.

Based upon this assessment, the Proposed Project:

- Would not increase mobile or stationary source emissions (including greenhouse gas emissions) since there are no changes in the number of aircraft operations or vehicular use (detailed energy modeling to be completed as part of the design process will quantify any potential minor building emissions);
- Would not cause or contribute to violations of NAAQS;

7 EPA, Implementation of the 2008 National Ambient Air Quality Standards (NAAQS) for Ozone: State Implementation Plan (SIP) Requirements, https://www.epa.gov/ozone-pollution/implementation-2008-national-ambient-air-quality-standards-naaqs-ozone-state.

- Would not cause additional or worsen existing violations of or contribute to new violations of the NAAQS; and
- Would not affect attainment of the NAAQSs.

This section summarizes the air quality evaluation conducted for the Proposed Project. A detailed description of the methodology and analyses are provided in Appendix C.

4.3.2.1 Direct Impacts – Air Quality

Mobile Source Emissions

No-Action Alternative – Under the No-Action Alternative no improvements to the terminal area roadway network or curbside areas would be implemented, resulting in increased traffic congestion as the airport continues to experience growth. Even though smaller emission inventories are expected with the passage of time, the continuing increase in traffic congestion within the Terminal C area will result in additional vehicles idling time which would likely result in increased air quality emissions as compared to existing conditions.

Proposed Project – The level of aircraft operations at Logan Airport would not be altered compared to the No-Action Alternative. As a result, CO emissions would not increase Airport-wide, compared to the No-Action Alternative. However, the Proposed Project would alter landside ground access activities of the arrivals and departures levels of Terminal C to improve efficiency and alleviate curbside congestion.

The Proposed Project would expand the roadway access and curbside design of the arrivals and departures level of Terminal C, as well as the existing overhead canopy above the departures level. An air quality assessment of the arrivals level was performed to review the impacts of the Terminal C Canopy, Connector, and Roadway Project on air quality due to the larger canopy being proposed. The potential air quality impact was determined based upon the potential emissions from a "worst case" scenario of vehicles idling in the arrivals area. Emissions were calculated for a design year of 2030 using the MOVES2014a and the AERMOD models. The analysis accounted for both passenger cars (including taxis) and Massport bus operations on the arrivals level. A conservative approach was used by assuming that a full queue of vehicles would idle for one hour in each operating lane of the arrivals level.

Background Concentrations. The total concentrations that air quality receptor locations will experience include background concentrations from other surrounding emission sources. Background concentrations are ambient pollution levels from other stationary, mobile, and area sources. The Massachusetts Department of Environmental Protection (MassDEP) maintains an air quality monitoring network and produces annual air quality reports that include monitoring data for CO, NO_x, PM_{10}, $PM_{2.5}$ and SO_2. The closest monitoring site with data available was used in this analysis located at 19 Von Hillern in Boston, MA. Where data was unavailable at Von Hillern, the next closest monitoring station (174 North Street in Boston, MA) was used. The background concentration values of the pollutants modeled in this air quality analysis are shown in **Table 4-12**.

Table 4-12 Background Concentrations

Pollutant	Averaging Time	Monitoring Location	Background Concentration
Carbon Monoxide (CO)	1-Hour[1]	19 Von Hillern, Boston	1.9 ppm
	8-Hour[1]	19 Von Hillern, Boston	1.1 ppm
Particulate Matter ($PM_{2.5}$)	Annual[2]	174 North Street, Boston	7.1 µg/m^3
	24-Hour[2]	174 North Street, Boston	15.4 µg/m^3

1 Using the highest second-high value recorded in the three most recent years available. (2013-2015).
2 Using the average of the three values recorded in the past three years (2013-2015).

Projected emissions from the vehicle idling associated with the arrivals level are shown in **Table 4-13**. When compared to the background concentrations (existing emissions) presented above, all pollutants show a slight increase. However, these emissions are well below the NAAQS requirements.

Table 4-13 Predicted Emissions for Terminal C Arrivals Level

Pollutants	National Ambient Air Quality Standards (NAAQS)	Project Emissions[1]
Carbon Monoxide (CO) 1-Hour[1]	9 ppm	3.08 ppm
Carbon Monoxide (CO) 8-Hour[2]	35 ppm	1.61 ppm
Particulate Matter ($PM_{2.5}$)[4] Annual	12 ug/m^3	8.73 ug/m^3
Particulate Matter ($PM_{2.5}$) 24-Hour[3]	35 ug/m^3	20.23 ug/m^3

1 The 1-hr CO concentration includes a 1.9 ppm background. The 1-hr CO NAAQS is 35 ppm.
2 The 8-hr CO concentration includes a 1.1 ppm background. The 8-hr CO NAAQS is 9 ppm.
3 The Annual $PM_{2.5}$ concentration includes a 7.1 µg/m^3 background. The Annual $PM_{2.5}$ NAAQS is 12.0 µg/m^3.
4 The 24-hr $PM_{2.5}$ concentration includes a 156 µg/m^3 background. The 24-hr $PM_{2.5}$ NAAQS is 35 µg/m^3.

Stationary Source Emissions

No-Action Alternative – Under the No-Action Alternative stationary sources of emissions would remain essentially the same as existing conditions. No renovations to Terminal C, including upgrades of its heating/cooling systems or replacement of inefficient equipment, would occur.

Proposed Project – No significant changes to stationary sources of emissions, including greenhouse gas emissions associated with building energy use would result due to the Proposed Project compared to the No-Action Alternative. The Proposed Project would include new construction as well as renovations to

existing building layouts and heating/cooling systems. The Project would use energy from the central plant and major systems, and more efficient equipment as documented below.

In addition, the project is consistent with FAA *Order 5050.4B*, Table 6-2:

> *Passenger handling building: construct or expand a terminal passenger handling building at an existing commercial service airport that does not substantially expand the building.*

According to the Presumed to Conform List,[8] the project would be considered under paragraph (6), Terminal and Concourse Upgrades. This category includes projects that expand or upgrade terminals and concourses and that do not have the effect of attracting more passengers, increasing the airport's ability to accommodate additional numbers or types or aircraft, or increasing passenger loading. A proposed terminal/concourse expansion project is presumed to conform up to the square foot additions of the project as determined by the most limiting pollutant. According to Table III-I of the Federal Register notice, the square foot threshold for the most limiting pollutant (Ozone) is 185,891 square feet. The Project would include approximately 72,907 square feet of net new construction and therefore is presumed to conform with the Clean Air Act. This indicates that that the Proposed Project conforms to the SIP and would not cause, or contribute to, a violation of the NAAQS.

4.3.2.2 Indirect Impacts – Air Quality

No indirect air quality impacts are anticipated from the Proposed Project since there are no changes in the number of aircraft operations or vehicles associated with the Project.

4.3.2.3 Temporary Construction-Related Impacts – Air Quality

Construction activities associated with the minor demolition and building of the new portions of the terminal, as well as with construction vehicles and equipment could result in temporary increase in air quality impacts. The primary source of potential emissions is from fugitive dust resulting from construction operations (such as, clearing, grading). Fugitive dust consists of soil particles that become airborne when disturbed by heavy equipment operation or through wind erosion of exposed soil after groundcover (for example, lawn, pavement) is removed.

There are requirements established by Federal Conformity Rules regarding construction periods and impact evaluation procedures, which include quantitative analysis construction emissions - except for short-term construction activities lasting less than five years. Based on the current construction sequencing, the Project could be constructed and open for service in less than five years. Construction activity would vary geographically and, as presented in **Figure 1-4**, the duration at each of the locations are all temporary in nature where the total duration for the Terminal C Project as a whole is less than five years. A quantitative assessment of air quality for construction is not warranted based on the short-term nature of the construction activities.

Emissions from the operation of construction machinery (CO, NO_x, PM, VOCs, and greenhouse gases) are short-term and not generally considered substantial. With the implementation of the various mitigation measures (discussed below) to minimize construction-related air quality impacts, no significant adverse

8 If an action/project is in a category of activities designated by a Federal agency (in this case the FAA) as having emissions below *de minimis levels* or otherwise do not interfere with the applicable SIP or the attainment and maintenance of the NAAQS, then the action/project is presumed to conform. FAA *Order 5050.4B*, Table 6-2

impacts would be expected. City of Boston and Massachusetts Clean Air Quality requirements will be enforced during the construction. Massport is committed to ensuring that the short-term construction-related air quality impacts will be minimized and that no significant adverse impacts would be expected. Consistent with other projects constructed at Logan Airport, Massport will implement the following short-term construction air quality emissions reduction measures.

Massport will require the contractor to utilize ultra-low sulfur diesel fuel for off-road construction vehicles and/or equipment. Construction contracts will require that gasoline and diesel motorized construction equipment be well maintained and in good running order during the work effort on the Proposed Project.

Fugitive dust emissions are proportional to the amount of earth moved and the length of travel on unpaved roads. Any impacts from fugitive dust particles would be of short duration and localized. Mitigating fugitive dust emissions involves curbing or eliminating its generation. Mitigation measures that will be used in site construction include wetting and stabilization to suppress dust generation, cleaning paved roadways, and scheduling construction to minimize the amount and duration of exposed earth.

The construction of the Proposed Project will comply with the requirements of the MassDEP's Clean Construction Equipment Initiative aimed at reducing air emissions from diesel-powered construction equipment. Massport requires that construction contractors install emission control devices, such as diesel oxidation catalysts and/or diesel particulate filters on certain equipment types (front-end loaders, backhoes, excavators, cranes, and air compressors).[9] Idle reduction and dust and odor control would also be addressed.

Massport requires all contractors to adhere to construction worker vehicle trip management, including requiring contractors to provide off-airport parking and using high-occupancy vehicle transportation modes for employees.

In addition, construction emissions will be reduced and controlled by contractor implementation of the following best management practices:

- Provisions for construction-worker site access/egress using dedicated buses and vans;
- Reduction of exposed erodible surface areas to the extent possible;
- Covering of exposed surface areas with pavement or vegetation in an expeditious manner and periodic watering;
- Reduction of equipment idling times;
- Reduction of onsite vehicle speeds;
- Ensuring contractor knowledge/implementation of appropriate fugitive dust and equipment exhaust controls;
- Use of low- or zero-emissions equipment to the extent possible; and
- Use of covered haul trucks during materials transportation.

9 The goal of these initiatives is to reduce the emissions associated with construction equipment. The effort involves retrofitting heavy construction equipment with emission control devices designed to reduce the amount of air pollution (volatile organic compounds (VOCs), carbon monoxide (CO), and particulate matter (PM)) emitted from the vehicle.

4.3.2.4 Mitigation/Beneficial Measures – Air Quality

As part of the design of the Project the following measures will be incorporated into the design including, new air-handling units to replace the original existing high-maintenance and low-efficiency machines, resulting in lower emissions.

There is a wide assortment of other measures that Massport has undertaken to reduce air emissions and the Airport's impact on air quality. Described in the EDRs/ESPRs, these measures include, but are not limited to:

- All repositioned/new jet bridges will continue to be provided with 400 Hertz (Hz) power and pre-conditioned air (PCA) to reduce the use of aircraft on-board diesel powered auxiliary power units (APUs) and reduce associated air emissions, including greenhouse gas emissions;
- The purchase and operation of no- and low-emitting (i.e., electric and clean fuel) buses and other Massport fleet vehicles;
- The use of solar panels and wind generators for electricity;

4.3.2.5 Cumulative Impacts – Air Quality

Since the Proposed Project would accommodate the same number of aircraft operations and passengers as the No-Action Alternative, there are no additional cumulative impacts associated with the Project. The expansion of the existing overhead canopy and departures level roadway will not significantly restrict airflow to the arrivals level and will therefore not cause any additional cumulative impacts associated with the Project. The *Logan Airport EDR*s and *ESPR*s document the Airport-wide air quality conditions for 2015 and forecast through 2030.

4.3.3 Noise and Noise-Compatible Land Use

Under FAA *Order 1050.1F* and *Order 5050.4B*, a significant adverse effect occurs when the Proposed Action, compared to the No-Action Alternative in the same timeframe, would cause noise sensitive areas located at or above the Day-Night Average Sound Level[10] (DNL) 65 decibels (dB) to experience a noise increase of at least DNL 1.5 dB. Noise is evaluated in terms of any changes in noise sources associated with the future Terminal C Canopy, Connector, and Roadway Project when compared to the No-Action Alternative.

The same number of aircraft operations would be accommodated with or without the proposed Terminal C Canopy, Connector, and Roadway Project, thus no changes to the noise environment at Logan Airport are anticipated. Annual changes to Airport-wide noise levels due to overall changes in the number of aircraft operations and fleet mix will continue to be reported in the annual EDR/ESPR documents. Noise related to short-term construction activities is discussed in Section 4.3.3.3, *Temporary Construction-Related Impacts - Noise*. The current noise environment is described in Chapter 4, *Affected Environment*.

4.3.3.1 Direct Impacts – Noise

No-Action Alternative – Overall noise levels caused by aircraft on the runways and in flight in the vicinity of Logan Airport is documented in the annual EDRs and ESPRs. Noise conditions under the future No-Action Alternative will continue to be assessed in the forthcoming *2017 ESPR.*

Proposed Project - The same number of aircraft operations would be accommodated with the No-Action Alternative and the proposed Terminal C Canopy, Connector, and Roadway Project, thus no changes to the noise environment at Logan Airport are anticipated.

4.3.3.2 Indirect Impacts - Noise

No indirect noise impacts are anticipated from the Project. The same number of aircraft operations would be accommodated with the No-Action Alternative as with the proposed Terminal C Canopy, Connector, and Roadway Project.

4.3.3.3 Temporary Construction-Related Impacts – Noise

During construction of the Terminal C Canopy, Connector, and Roadway Project, short-term noise associated with the renovation and improvement activities would be generated. Construction equipment is expected to be used intermittently throughout the Project's construction during the typical working hours of 7:00 AM to 5:00 PM. Significant nighttime or weekend work is not anticipated during exterior construction. Certain elements of interior renovation would occur during nighttime to allow terminal operations to continue during normal hours. Normal flight operations would continue during Project construction.

The Proposed Project is expected to generate typical sound levels associated with construction activities, including use of equipment, operations, material transport, and limited pile driving. The type of equipment and units of equipment would vary among the different construction phases. Typical

10 DNL refers to the Day-Night Average Sound Level, the metric required in FAA *Order 1050.1F* for the consideration of aircraft noise exposure in NEPA documents. The DNL represents the average annual aircraft noise exposure reflecting a cumulative A-weighted sound level over a 24-hour period, including a sound level weighting for aircraft events between 10:00:00 PM and 6:59:59 AM.

equipment would include: aerial lifts, asphalt and concrete pavers, augers and backhoes, bulldozers, a mobile crane, dump trucks and trailers, excavators and graders, rollers, a pile vibrator, trucks, sweepers, water pumps and tricks, and concrete pump trucks and mixers. **Table 4-9** lists the construction equipment requirements for the Terminal C Canopy, Connector, and Roadway Project, reflecting the needs for all three Project components – Optimization and C to B Connector, B to C Roadways Improvements, and Canopy and Curbside Improvements.

In 2012, Massport prepared an EA to assess the renovations and improvements at Terminal B and C/E project.[11] The EA for the Renovations and Improvements at Terminal B and C/E project analyzed four sensitive noise receptors (East Boston Yacht Club, Loring Road near Court Road, Somerset Avenue near Johnson Avenue and Jeffries Point Yacht Club). The assessment evaluated the worst-case scenario which assumed all construction equipment operates simultaneously, which is a conservative assumption as the types of equipment and number of equipment will vary throughout the various phases of construction. The noise assessment utilized the Federal Highway Administration's Roadway Construction Noise Model to calculate sound levels at the nearby residential neighborhoods and compared to the City of Boston's construction noise limit. **Table 4-14** summarizes the results determined during that assessment and illustrates that there were no adverse noise construction-related impacts for the Terminal B and C/E project.

Table 4-14 – Table 5-8 from Renovations and Improvements at Terminals B and C/E EA Project Construction Activity Sound Levels, dB(A)

Noise Sensitive Location	Calculated L10 Sound Levels	Calculated Lmax Sound Levels	City of Boston L10 Criteria	City of Boston Lmax Criteria
Receptor 1 East Boston Yacht Club	62	45	75	86
Receptor 2 Loring Rd near Court Rd	62	43	75	86
Receptor 3 Somerset Ave near Johnson Ave	61	42	75	86
Receptor 4 Jeffries Point Yacht Club	64	49	75	86

Source: Table 5-8, Environmental Assessment – Renovations and Improvements at Terminals B & C/E at Boston Logan International Airport, May 2012.

The construction equipment requirements and schedule presented in **Table 4-9** indicate that a higher number of equipment are estimated than those for the Terminal B and C/E project. Based on the list of equipment and location of the Proposed Project, the noise levels associated with the construction activities are expected to be similar or greater than those calculated for the Terminals B and C/E project (shown in **Table 4-14**). The noise levels at the nearby sensitive receptor locations presented in **Table 4-14** for the Terminal -B-C Infrastructure and Facility Improvements construction activities are expected to be similar to those associated with the Terminal B and C/E project. Although the Terminal C Canopy,

11 Massport. 2012. *Renovations and Improvements at Terminals B & C/E*, https://www.massport.com/media/2917/2012_EA_Terminal_B_CE_Complete.pdf. Accessed March 20, 2017.

Connector, and Roadway Project consists of more daily equipment, a large portion of the construction activities for the Project focuses on the roadway system between Terminals B and C.

- At Receptors 1-3, the construction activities associated with the Terminal C Canopy, Connector, and Roadway Project have the benefit of the Terminal C structures to provide noise shielding to these neighborhoods to the north and east, thus negating the noise level increases associated with the additional equipment.
- At the neighborhood near Receptor 4 to the west, the Terminal A structures will provide shielding between the construction activities and neighborhood. Therefore, limiting the potential increase attributed to the decrease in distance to the receptor and additional number of equipment.

4.3.3.4 Mitigation/Beneficial Measures – Noise

The same number of aircraft operations would be accommodated with the No-Action Alternative and the proposed Terminal C Canopy, Connector, and Roadway Project, thus no changes to the noise environment at Logan Airport are anticipated. Therefore, mitigation for long-term effects is not required

Sound levels from activities associated with the construction of the Terminal C Canopy, Connector, and Roadway Project would comply with the City of Boston's noise criteria (**Table 4-14**); therefore, no noise mitigation is required. However, construction equipment would use noise-reduction measures such as the use of proper mufflers for construction equipment, measures to limit noise from truck traffic as well as truck idling, and keeping exterior construction activities within typical business hours.

4.3.3.5 Cumulative Impacts – Noise

Other reasonably foreseeable projects under construction during the Terminal C Canopy, Connector, and Roadway Project construction phase include the Terminal B Optimization Project, Terminal E Modernization Project, and the Logan Airport Parking Project. None of these projects are in the immediate vicinity of the Proposed Project and are separated from the project by other buildings and roadways. The nearby communities of East Boston and Jeffries Point will not be impacted by the cumulative noise levels of the Project and other ongoing construction activities due to their distance from construction sites. Therefore, when considered cumulatively, the Terminal C Canopy, Connector, and Roadway Project would not result in adverse noise impacts.

4.3.4 Natural Resources and Energy Supply

FAA has not established a significance threshold for Natural Resources and Energy Supply; however, under FAA *Order 1050.1F* and *Order 5050.4B*, it states that an action's construction, operation, and maintenance could cause demand to exceed available or future supplies of these resources. Accordingly, this section looks at the potential of the Terminal C Canopy, Connector, and Roadway Project to cause demand for natural resources, such as potable water, consumable materials, and energy, to exceed available and future supplies.

The Terminal C Canopy, Connector, and Roadway Project would not have a significant adverse impact on natural resources or energy supplies because there is sufficient capacity available to support the operation of the new building systems.

4.3.4.1 Direct Impacts – Natural Resources and Energy Supply

No-Action Alternative –Under the No-Action Alternative, no new construction or renovations will be done to Terminal C, only routine maintenance and repair would be conducted.

Proposed Project – The Proposed Project will be designed in accordance with Massport's Sustainable Design Standards and Guidelines as well as Massachusetts Leadership in Energy and Environmental Design (LEED®) Silver Commercial Interiors Version 4 Certification.

The Proposed Project would not place undue burdens on the area's energy system compared to the No-Action Alternative as there are sufficient energy resources to supply the Terminal C Canopy, Connector, and Roadway Project. Newer technology lighting fixtures such as LED and lighting control systems to reduce energy usage will be employed. Energy efficient heating and cooling systems will be provided including energy recovery, efficient motors, fresh air monitoring and reduced pressure loss air handling units. Additionally, all new elevators will be highly energy efficient with software and microprocessor based controls instead of electromechanical relays.

The Terminal C Canopy, Connector, and Roadway Project would not result in a significant increase in water use, and thus would not create additional demand on regional water resources compared to the No-Action Alternative. Water consumption in Terminal C is related directly to the number of passengers and employees that use the facility. Similarly, the quantity of sewage flow from Terminal C is related directly to the number of passengers and employees. The same number of passengers would be processed in both the No-Action Alternative and Proposed Project. Regardless, high efficiency, low and ultra-low water use fixtures will be specified as appropriate to reduce potable water usage.

The design of the Project does not include unusual building materials or materials that are in scarce supply in the Boston metropolitan area or larger New England region; therefore, there would be no adverse impact to the supply of raw materials. Materials will be selected for their environmental and human health impacts including recycled content, sourcing, environmental product declarations, cradle to cradle certification, and transparency declarations such as health product declarations or declare labels. Lightweight roofing materials will be used which reduces material needs and embodied energy and carbon in steel.

4.3.4.2 Indirect Impacts – Natural Resources and Energy Supply

No indirect natural resources or energy supply impacts are anticipated from the Proposed Project. The Terminal C Canopy, Connector, and Roadway Project would accommodate existing and projected air service at Terminal C, and would not grow such demand. It would not induce additional development within or outside of Logan Airport.

4.3.4.3 Temporary Construction-Related Impacts – Natural Resources and Energy Supply

Construction of the Terminal C Canopy, Connector, and Roadway Project would require additional energy supply to power construction vehicles and equipment, and construction activities would temporarily increase water demand for the purposes of controlling fugitive dust and stabilizing soil. Massport anticipates that adequate capacities of energy and water will be available to support these activities.

4.3.4.4 Mitigation/Beneficial Measures – Natural Resources and Energy Supply

No natural resource impacts are anticipated from the Terminal C Canopy, Connector, and Roadway Project. The Project also would not place undue burdens on the area's energy system. It will be designed in accordance with Massport's Sustainable Design Standards and Guidelines as well as Massachusetts LEED® for New Construction (LEED®-NC). The following energy savings strategies would be considered:

- Design Project to achieve energy efficiencies better than the Massachusetts energy code, American Society of Heating, Refrigerating and Air-Conditioning Engineers 90.1-2013 requirements;
- Incorporate materials to reduce heat island effects for roof and non-roof surfaces;
- Use a no-glare roofing membrane;
- Provide energy efficient interior and exterior lighting and heating and cooling systems and controls;
- Install submetering to monitor tenant energy use and use energy from the central plant and major systems;
- Incorporate high performance glazing and increase roof insulation (R-40);
- Use microprocessor based elevator controls;
- Install pre-conditioned air and ground power at all gates to reduce greenhouse gas emissions for aircraft; and
- Provide charging stations for electric ground equipment (GSE).

4.3.4.5 Cumulative Impacts - Natural Resources and Energy Supply

When added to past, present, and reasonably foreseeable future actions, the Terminal C Canopy, Connector, and Roadway Project would not result in an incremental impact to natural resources and energy supply. As previous sections establish, adequate capacities of energy, water, and raw materials will exist in the region to support all known projects.

4.3.5 Climate

The FAA has not established a significance threshold for climate and greenhouse gas emissions. To address the potential effects of climate change, Massport considers resiliency and climate adaptation strategies in each of the planning phases for new capital projects. Additionally, greenhouse gases associated with a proposed action and its alternatives were evaluated.

4.3.5.1 Direct Impacts – Climate

No-Action Alternative – Under the No-Action Alternative no improvements to the terminal area roadway network or curbside areas would be implemented, resulting in increased traffic congestion as the airport continues to experience growth. As such, greenhouse gas emissions related to the increased traffic congestion and continued airport growth are expected to continue to increase. The No Action Alternative does not include any substantial changes to the terminal building that would cause greenhouse gas emissions to vary significantly from the existing condition. As such, energy consumption

and associated greenhouse gas emissions associated with the Project Study Area is expected to be similar to the consumption and emissions of the existing conditions.

Proposed Project –Similar to air quality, the Proposed Project was evaluated in terms of any changes in mobile and stationary sources associated with the Terminal C Canopy, Connector, and Roadway Project when compared to the No-Action Alternative. The additional building area would have additional energy requirements and there would be minimal resulting emissions. As noted above in Section 4.3.2, there would be no significant changes to mobile or stationary source direct and indirect emissions, including greenhouse gas emissions, and energy conservation measures and energy efficient equipment would be incorporated into the Proposed Project's design and equipment selection. To the extent possible, energy efficient equipment would be incorporated and the Terminal C Optimization and C to B Connector element of the project would strive to achieve LEED® Commercial Interiors Silver certification.

Massport also considers resiliency and climate adaptation strategies in each of the planning phases for new capital projects. For the Terminal C Canopy, Connector, and Roadway Project, the design considers the location of critical infrastructure such as energy sources or digital services. Critical systems such as electric equipment were identified and would be positioned in locations above the Design Flood Elevation. Consistent with Massport's resiliency and energy goals, the Project would also incorporate redundant power capabilities, where feasible. The ability of facilities to withstand extreme weather conditions such as high winds and flooding area also factored into the design of the building and facility upgrades.

4.3.5.2 Indirect Impacts – Climate

No indirect greenhouse gas emissions are anticipated to be generated by the Proposed Project.

4.3.5.3 Temporary Construction Impacts – Climate

Massport includes consideration of climate adaptation and resiliency measures as part of its construction efforts as documented in the EDRs and ESPRs.

4.3.5.4 Mitigation/Beneficial Measures – Climate

Guidelines that would be applied to the Terminal C Canopy, Connector, and Roadway Project are outlined below. Massport periodically coordinates with the Massachusetts Office of Coastal Zone Management regarding measures to enhance resiliency and minimize potential coastal storm-related impacts. The following resiliency measures would be implemented:

- In general, all areas of the first floor (lowest level) of the Proposed Project are above the Design Flood Elevation (DFE) for existing structures. All new critical equipment is above the DFE for new construction. Thus, important utilities, life safety systems, and other critical equipment are generally above the DFE.
- Where spaces must be below the DFE, both floodproofing and dry floodproofing measures would be reviewed based on the intended use of that space and the overall criticality of the equipment and other assets that might be impacted. These measures would be reviewed to align with Massport's Floodproofing Design Guidelines. Measures which could be considered include:

- Use water resistant and/or waterproof materials in areas exposed to flooding;
- Install watertight shields on doors, windows, and louvers;
- Use exterior and interior membranes and sealants to reduce seepage;
- Seal electrical conduits and other utilities entering below the DFE;
- Install drainage collection systems and sump pumps;
- Install early warning devices to monitor water levels;
- Install backflow preventer valves on drainage and sanitary sewer piping located below the DFE;
- Install flood openings to equalize the hydrostatic pressure; and
- Provide pumps to remove floodwater in non-draining areas.

Equipment and systems will also be designed for increased extremes of peak heating and cooling degree days.

4.3.5.5 Cumulative Impacts – Climate

No climate impacts or additional greenhouse gas emissions are anticipated from the Terminal C Canopy, Connector, and Roadway Project. There are no reasonably foreseeable projects within the Terminal C study area that would influence greenhouse gas emissions. The EDRs and ESPRs report on greenhouse gas emissions Airport-wide. As documented in the *2016 EDR*, Logan Airport greenhouse gas emissions continue to be less than 1 percent of statewide greenhouse gas emissions.

Massport prepares greenhouse gas emission inventories annually for stationary sources regulated by the Environmental Protection Agency (EPA) and the MassDEP; passengers traveling to, from, and moving about the Airport; and for the EDRs/ESPRs inclusive of aircraft, ground support equipment, auxiliary power units, ground access vehicles, and stationary sources.

4.3.6 Historical, Architectural, Archaeological, and Cultural Resources

4.3.6.1 Direct Impacts – Historical Resources

No-Action Alternative—The Project site encompasses the one resource that is included in the Inventory of Historical and Archaeological Assets of the Commonwealth maintained by the Massachusetts SHPO/Massachusetts Historical Commission: Our Lady of the Airways Chapel in Terminal C. Under the No-Action Alternative, the Chapel would remain open to the public and there would be no change to its current function as an airport chapel.

Proposed Project - The Project would maintain the Our Lady of the Airways Chapel located within Terminal C; no demolition or renovations would occur. The Chapel will remain open and accessible throughout the construction period. There will be no direct impacts to the Chapel under the proposed Project.

4.3.6.2 Indirect Impacts – Historical Resources

No indirect impacts to historic, architectural, archaeological, or cultural resources are anticipated to be generated by the Proposed Project.

4.3.6.3 Temporary Construction-Related Impacts – Historical Resources

Our Lady of the Airways Chapel will remain open to the public during the construction period. There will be no temporary construction -related impacts to historic, architectural, archaeological, or cultural resources.

4.3.6.4 Mitigation/Beneficial Measures – Historical Resources

The Proposed Project will improve access between Terminal C and B, which will also improve access to the Chapel, facilitating the potential for greater use by the public.

4.3.6.5 Cumulative Impacts – Historical Resources

No cumulative impacts to historic, architectural, archaeological, or cultural resources are anticipated to be generated by the Proposed Project.

4.3.7 Water Resources/Surface Waters

FAA *Order 1050.1F* lists several factors to consider for surface waters, which include an action's potential to: adversely affect natural and beneficial water resource values; adversely affect surface waters; and create water quality impacts that make obtaining a permit or authorization difficult. FAA *Order 1050.1F* and *Order 5050.4B* require that the EA include sufficient description of a Proposed Project's design and mitigation measures developed for non-point sources under Section 319 of the Clean Water Act, and construction controls to demonstrate that water quality standards and any permit requirements will be met.

The Project Area is located on fully developed, impervious land in Airport use. The Terminal C Canopy, Connector, and Roadway Project would convert a small landscaped area at the base of the Central Garage (approximately 2,800 sf) to access roadway but would not impact wetlands, floodplains, or groundwater. Therefore, this section focuses only on stormwater and surface water quality. No direct or indirect water quality impacts are anticipated from the Project.

4.3.7.1 Direct Impacts – Water Resources

No-Action Alternative – Under the No-Action Alternative, the site would remain in active Airport use, the amount of impervious area would remain the same, the existing stormwater collection system would stay in place, and the existing end-of-pipe pollution controls would remain. Massport would continue conducting outfall sampling according to its National Pollutant Discharge Elimination System (NPDES) permit. Massport would continue implementing best management practices for pollution prevention by Massport, its tenants, and its construction contractors.

As described in Chapter 4, *Affected Environment*, Massport holds a NPDES permit for stormwater discharge at the major outfalls within the Airport. In compliance with the NPDES permit, Massport monitors discharges and submits reports to the EPA and MassDEP. Massport's Stormwater Pollution

Prevention Plan addresses stormwater pollutants in general, and addresses deicing and anti-icing chemical, potential bacteria, fuel and oil, and other sources of stormwater pollutants. Additionally, Massport has a *Deicing Plan* (2008) that guides best practices on the Airport and to satisfy the requirements in Section 1.D Water Quality Study in National Pollutant Discharge Elimination System (NPDES) Permit No. MA0000787 issued to Massport and Co-Permittees of Logan Airport. Massport manages stormwater discharges and protects groundwater resources from aircraft deicing operations during the winter months.

Proposed Project –The majority of the areas proposed for Terminal C Canopy, Connector, and Roadway Project are already paved. While new roof area is being added as part of the new connector, it will be located above existing tarmac and parking areas; thus, no net increase in stormwater will occur. Similarly, although the replacement canopy will be larger, than the existing canopy, rainwater that will fall on the extended portion of the larger canopy is currently falling on the existing road surface. Nevertheless, roof drainage systems will be designed with adequate snow retention, gutters and leader systems to be connected to the existing system. An overflow roof drainage system will be required by code and will be achieved through overflow scuppers. Additionally, drainage will be shifted to the additional roof areas which are generally cleaner than those currently occurring at ramps, curbside lanes, parking areas and tarmac.

With the proposed changes to roadway alignments and structures, the roadway drainage network will be primarily new construction throughout the Project limits. The major existing drainage trunk-line for this area is located within the Central Garage, directly under the lane that will be used as the Terminal C arrivals pick-up area during some construction phases. A new structural liner will be installed within this drainage line south of the Central Garage. The pipe lining will correct cracked, broken and collapsed pipe, prevent infiltration of groundwater, roots and soil through leaking pipe joints and structural defects, and prevent exfiltration of drain runoff. In addition, approximately 1,100 feet of existing drainage pipes will be cleaned to remove debris, grease, roots, mineral deposits, etc. The Project will also install new stormceptors to improve water quality.

The existing drainage line discharges to a permitted outfall referred as the Bird Island Flats (BIF)/West Outfall in the Logan Airport NPDES Permit. The Bird Island Flats/West Outfall is equipped with a pollution control system that includes a bar screen for collecting debris and a skimmer for diverting oils to an oil/water separator. Due to the location of the lateral drain lines feeding this drainage trunk line relative to the new roadway network, it is anticipated that certain lateral drain lines will need to be rerouted and connected back to the existing drainage trunk line. There is no anticipated impact to the drainage trunk line. Three existing stormwater pump stations are located within the Project area:

1) Within the abandoned Terminal A Egress Tunnel (not affected);
2) Near the southwest corner of the Central Garage (not affected);
3) Along the Terminal B departures roadway exit (replaced/upgraded).

The third pump station will be affected by construction of the new viaduct structure. A new pump station will be provided, which will connect to the existing Terminal A drainage line. Specific best management practices to improving stormwater treatment and controlling stormwater discharges were evaluated to provide better water quality and quantity and to minimize potential impacts of surface water on groundwater and coastal resource areas. Stormwater best management practices that will be considered

to control runoff, address peak rate attenuation, provide groundwater recharge, and improve water quality, include:

- New deep sump catch basins,
- New drain manholes,
- Infiltration trenches,
- Hydrodynamic separators, and
- Oil/water separators.

These Best Management Practices (BMP) were selected due to consideration of soil texture, groundwater, bedrock, land area, topography, existing utilities, aesthetics, setback and permitting requirements, and maintenance. The new stormwater manager system will meet or exceed Massport Sustainable Design Standards and Guidelines, EPA's NPDES Permit, and MassDEP Stormwater Standards.

4.3.7.2 Indirect Impacts – Water Resources

No impacts to stormwater or surface water quality are anticipated from the Terminal C Canopy, Connector, and Roadway Project. Stormwater from the Proposed Project would continue to be accommodated in the existing stormwater collection and treatment system, which discharges to Boston Harbor. Nevertheless, improvements are being proposed as part of the Proposed Project as discussed below.

4.3.7.3 Temporary Construction-Related Impacts – Water Resources

Since the Terminal C Canopy, Connector, and Roadway Project involve construction disturbance of greater than one acre of land, a project-specific Stormwater Pollution Prevention Plan will be prepared in accordance with the EPA's NPDES General Permit for Construction Activities. The plan will ensure that construction activities do not result in impacts to water quality within Boston Harbor.

Massport has developed a dewatering and discharge plan for all construction projects at Logan Airport. If required, groundwater treatment and discharge construction practices would be defined and submitted to MassDEP for approval and implemented during construction. Massport would not discharge storm or groundwater to the sanitary sewer system.

4.3.7.4 Mitigation/Beneficial Measures – Water Resources

While new roof area is being added as part of the Project, it will be located above paved area; thus, no net increase in stormwater will occur as a result. Nevertheless, roof drainage systems will be designed with adequate snow retention, gutters and leader systems to be connected to the existing system. An overflow roof drainage system will be required by code and will be achieved through overflow scuppers. Additionally, drainage will be shifted to the additional roof areas which are generally cleaner than those currently occurring at ramps, curbside lanes, parking areas and tarmac.

Additionally, specific BMP's were evaluated with the goal to improve stormwater treatment, control stormwater discharges, provide better water quality and quantity, and to minimize potential impacts of surface water on groundwater and coastal resource areas. Stormwater BMP's that will be considered to

control runoff, address peak rate attenuation, provide groundwater recharge, and improve water quality, include:

- New deep sump catch basins,
- Infiltration trenches,
- Hydrodynamic separators, and
- Oil/water separators.

These BMPs were selected due to consideration of soil texture, groundwater, bedrock, land area, topography, existing utilities, aesthetics, setback and permitting requirements, and maintenance. The new stormwater manager system will meet Massport Sustainable Design Standards and Guidelines, EPA's NPDES Permit, and MassDEP Stormwater Standards.

The Proposed Project will be required to comply with the requirements of the NPDES General Permit for Stormwater Discharges from Construction Activities. NPDES requires the filing of a Notice of Intent and a Stormwater Pollution Prevention Plan. An Erosion and Sedimentation Control Program will be put in place to minimize construction phase impacts to Boston Harbor and adjacent resources.

4.3.7.5 Cumulative Impacts – Water Resources

No impacts to stormwater or surface water quality are anticipated from the Terminal C Canopy, Connector, and Roadway Project. There are no reasonably foreseeable projects within the Project area that would have an effect on stormwater management. Recently completed projects have included upgrades to the stormwater collection system Airport wide.

4.3.8 Hazardous Materials, Solid Waste, and Pollution Prevention

Under FAA *Order 1050.1F* and *Order 5050.4B*, a significant adverse effect may occur when a Proposed Project involves a property on or eligible for the National Priority List or involves significant hazardous or solid waste activities. The Terminal C Canopy, Connector, and Roadway Project would not have a significant adverse impact related to hazardous materials or solid waste, because, as established in Chapter 4, *Affected Environment*, Logan Airport is not on the federal National Priority List, and the Terminal C Canopy, Connector, and Roadway Project would not involve significant hazardous or solid waste activities. In addition, Massport complies with the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) when addressing releases of oil and/or hazardous materials (OHM) and tracks the status of response actions at each "disposal site." The Massachusetts Contingency Plan lays out a set of regulations that govern the reporting, assessment, and cleanup of spills of oils and hazardous materials in Massachusetts. Massport also maintains a Tank Management Program, a Stormwater Pollution Prevention Plan, and a Spill Prevention Control and Countermeasure Plan.

4.3.8.1 Direct Impacts – Hazardous Materials

No-Action Alternative – The No-Action Alternative would not result in any new construction and therefore there would be no disturbance of soil or need for disposal of hazardous materials.

Proposed Project – The Terminal C Canopy, Connector, and Roadway Project include several supporting infrastructure elements, piles that will support the new construction, and the relocation of associated

hydrant fuel pits to accommodate the aircraft positions. Additionally, the Project will demolish the Old Tower building, which has asbestos containing materials. The Terminal C Canopy, Connector, and Roadway Project would likely have a positive effect on confirmed areas of soil and groundwater contamination by advancing remediation prior to and during construction activities as per the Massachusetts Contingency Plan. It would also remove a building with asbestos containing materials.

4.3.8.2 Indirect Impacts – Hazardous Materials

Massport does not anticipate any indirect adverse impacts from the Proposed Project on hazardous materials, solid waste, and pollution prevention. Massport routinely manages contaminated environmental media and solid waste, and conducts careful oversight of the handling, transport, containment, and disposal of such materials to ensure there are no offsite effects.

4.3.8.3 Temporary Construction- Related Impacts – Hazardous Materials

There is the potential to encounter oils and hazardous materials and contaminated urban fill that requires special handling and management during construction. Additionally, asbestos containing materials, including roof flashing, tiles, and other materials may be present in the buildings that will be undergoing demolition, particularly the Old Tower, based on their age. In addition, lead based paint, mercury, and polychlorinated biphenyls (PCBs) may also be present in the building materials and/or fixtures. If these hazardous materials are encountered during construction, they will be appropriately disposed of in accordance with federal and state regulations.

Short-term construction activities are expected to cause temporary impacts related to solid and hazardous waste. During construction, Massport will promote and ensure special handling, dust control, and management and disposal of contaminated environmental media and hazardous building materials.

Preliminary assessment activities would be conducted prior to construction to identify the type and quantity of oils and hazardous materials impacted media and help select the optimal disposal methods and/or destination of media prior to generation. In particular, it is recommended that prior to the Old Tower demolition, a licensed asbestos and hazard materials contractor sample the building material, including roof flashing tiles, and other materials, as well as the potential lead-based paint, mercury and PCBs. Notification to MassDEP would be required if a reporting condition is identified as per the Massachusetts Contingency Plan, such as when oils and hazardous materials is detected in soil and/or groundwater above the applicable standards, referred to as the Reportable Concentrations. Any soil encountered during construction with oils and hazardous materials above the Massachusetts Contingency Plan Reportable Concentrations would be managed appropriately in accordance with the applicable state and federal regulations.

Should impacted soil be generated during Project-related excavation that requires export or on-site re-use, this material would be properly characterized and managed in accordance with applicable regulations. Proper management would ensure appropriate re-use within the Project Area to prevent exposure to contaminants or export to appropriate destinations. Although not anticipated, if oils and hazardous materials -impacted groundwater is encountered during Project construction, it would also be managed in accordance with applicable regulations.

4.3.8.4 Mitigation/Beneficial Measures – Hazardous Materials

Confirmed areas of soil and groundwater contamination will be remediated prior to and during construction activities per the Massachusetts Contingency Plan. Any materials containing OHM such as lead-based paint, asbestos, PCBs encountered during construction will be appropriately disposed of in accordance with federal and state regulations. Massport will also promote and ensure special handling, dust control, and management and disposal of contaminated environmental media and hazardous building materials. The demolition of the Old Tower would remove asbestos containing material from airport grounds.

Preliminary assessment activities would be conducted prior to construction to identify the type and quantity of OHM impacted media and help select the optimal disposal methods and/or destination of media prior to generation. Any soil encountered during construction with oils and hazardous materials above the Massachusetts Contingency Plan Reportable Concentrations would be managed appropriately in accordance with the applicable state and federal regulations.

Any impacted soil that requires export or on-site re-use would be properly characterized and managed in accordance with applicable regulations. Proper management would ensure appropriate re-use within the Project Area to prevent exposure to contaminants or export to appropriate destinations. Although not anticipated, if oils and hazardous materials -impacted groundwater is encountered during Project construction, it would also be managed in accordance with applicable regulations.

4.3.8.5 Cumulative Impacts – Hazardous Materials

Based on reasonably foreseeable projects, it is not anticipated that the Terminal C Canopy, Connector, and Roadway Project would contribute to significant adverse impacts related to the generation, transportation, storage, or release of hazardous materials.

4.3.9 Coastal Resources

FAA *Order 5050.1F* requires that when a Proposed Project changes the manner of use or quality of land, water, or other coastal resources, or limits the range or the use of the coastal zone in a state with an approved coastal zone management program, the EA must include a determination as to whether the proposal is consistent with the approved State Coastal Zone Management program.

Although the entire Airport is located within the defined coastal zone for Massachusetts, the terminal improvements are confined to fully developed areas of the airfield and terminal that are already in use for aviation activities. The Proposed Project would not change the manner of use, quality of land, or limit the range of use of or access to the coastal zone.

4.3.9.1 Temporary Construction Related-Impacts – Coastal Resources

Construction would be limited to areas already developed and in aviation use.

4.3.9.2 Mitigation/Beneficial Measures – Coastal Resources

Temporary impacts to coastal resources are not expected.

4.3.9.3 Cumulative Impacts – Coastal Resources

The Terminal C Canopy, Connector, and Roadway Project would not have an impact on coastal resources; therefore, it is not expected that the Project would contribute to cumulative impacts to coastal resources.

4.3.10 Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

FAA *Order 1050.1F* requires consideration of the impacts of the alternatives on "economic activity, employment, income, population, housing, public services, and social conditions."

4.3.10.1 Direct Impacts - Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

No-Action Alternative – Under the No-Action Alternative, neighborhoods in the vicinity of the Airport would continue to experience the same socioeconomic conditions as today. There would be no change to conditions for Environmental Justice communities, and children's health and safety. Roadways on the Airport would continue to operate as today with no disruptions to the community.

As described in Section 4.3.10, *Socioeconomics, Environmental Justice, and Children's Health and Safety Risks*, the Project Area is substantially distanced and buffered from the surrounding communities through elevated roadways, structures, and vegetative screening. The Terminal C Canopy, Connector, and Roadway Project would be constructed on existing Airport property and in an area where aircraft activities regularly occur.

Proposed Project –The Proposed Project would not have an adverse environmental impact to noise conditions, air quality, water quality nor soils, and, therefore, would not cause a disproportionately adverse impact to economic vitality, disadvantaged populations, or the health and safety of children within neighboring communities, including those identified as Environmental Justice communities.

4.3.10.2 Indirect Impacts - Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

The Terminal C Canopy, Connector, and Roadway Project would have positive indirect effects on local and regional socioeconomics. The improvements would greatly improve the efficiency of operations for airlines and tenants/concessionaires which will in turn have the potential to increase activity in the local economy through additional business-to-business activity between Massport tenants and local suppliers as well as between the local suppliers and other local businesses.

The Proposed Project would have no indirect impacts to Environmental Justice communities, nor children's health and safety since the Project is wholly located on Logan Airport, some distance from the community and no changes would be experienced off-Airport with respect to community disruption on roadways or to ground access.

4.3.10.3 Temporary Construction-Related Impacts - Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

The construction footprint of the Terminal C Canopy, Connector, and Roadway Project is within the existing Airport boundary and within an area currently under active use for aircraft operations, and other airport activities. Construction is not anticipated to have an adverse impact to the socioeconomics or children's health and safety of surrounding communities. As documented in this chapter, Massport routinely deploys many construction-period mitigation efforts to ensure protection of the environment and community.

Construction of the Terminal C Canopy, Connector, and Roadway Project would positively impact local employment opportunities by generating temporary construction jobs. This Project is estimated to generate approximately 644 direct, 386 indirect and 837 induced full time equivalents, for a project estimated total of 1,867 full time equivalents over a period of 36 months. Because the Terminal C Canopy, Connector, and Roadway Project would not have an adverse impact to socioeconomics or children's health and safety, there would be no disproportionate adverse impacts to local Environmental Justice communities.

4.3.10.4 Mitigation/Beneficial Measures – Socio-Economics, Environmental Justice, and Children's Health and Safety Risks

The Proposed Project would positively impact local employment opportunities by generating temporary construction jobs. The improvements would also greatly improve the efficiency of operations for airlines and tenants/concessionaires which will in turn have the potential to increase activity in the local economy through additional business-to-business activity between Massport tenants and local suppliers as well as between the local suppliers and other local businesses.

4.3.10.5 Cumulative Impacts – Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

FAA's NEPA regulations describe cumulative impacts as the incremental impact of a proposed project when added to the past, present, and reasonably foreseeable future projects undertaken by any agency or person. The Proposed Project would not result in a change to the number of passengers or aircraft projected to be accommodated at Logan Airport compared to the No-Action Alternative. Nor will the Proposed Project result in a disproportionate impact to Environmental Justice communities. Taken with the other ongoing, planned, and reasonably foreseeable projects, it is not anticipated that the Terminal C Canopy, Connector, and Roadway Project will have adverse cumulative impacts to socioeconomic conditions, nor Environmental Justice communities and children's health and safety.

4.4 Summary of Impacts

Table 4-15 summarizes impacts and mitigation measures associated with the Terminal C Canopy, Connector, and Roadway Project. The Project is expected to create no long-term adverse environmental impacts. The Project would occur on fully developed land already in airport use. There would be temporary, construction-period impacts that would be mitigated. The Project would also result in environmental benefits such as improvements to air quality and a reduction in traffic/delay.

Table 4-15 Summary of Impacts and Mitigation Measures/Benefits

Environmental Resource[1]	Significant Impact? (Yes/No)	Explanation
Surface Transportation	No	The Project would reconstruct the terminal area roadways in the vicinity of Terminals B and C and the Terminal C curbside. The Project will enhance safety, improve traffic flow, reduce queuing and delays, and will enhance curb operations at Terminal C. Priority to HOV modes will be incorporated in the design. These improvements will in turn result in air quality improvements. Construction mitigation measures include prohibiting trucks from using local streets, using existing plants with access via Route 1A or I-90 for concrete production and batching, encouraging construction workers to use public transportation, and managing vehicular traffic flow to maintain acceptable levels of service.
Air Quality	No	The Project would not affect the number of aircraft operations or generate any new ground access vehicle trips. Elements of the project will be designed to Leadership in Energy and Environmental Design for New Construction (LEED®-NC) certification and will include sustainable features such as outdoor air filtration, source control and low-emitting material selection. There would be no significant changes to stationary sources of emissions, including greenhouse gas emissions associated with building energy use. The Project is presumed to conform with the Clean Air Act. transportation infrastructure and operations management improvements included as part of the Project in combination with the Airport-wide Curbside Improvement Project would result in improved and more efficient ground access system that would be able to accommodate future passenger demands at Terminal B. Therefore, regarding air quality conditions associated with vehicles, the Project (including temporary construction activities) would not exceed a *de minimis* impact threshold and is in compliance with the Clean Air Act General Conformity regulations. Construction-period impacts would be minimal and mitigated. Construction mitigation measures include provisions for construction-worker site access/egress using dedicated buses and vans, reduction of exposed erodible surface areas as possible, covering of exposed surface areas with pavement or vegetation in an expeditious manner and periodic watering, reduction of equipment idling times, reduction of on-site vehicle speeds, control of fugitive dust and equipment exhaust, use of low or zero emissions equipment as possible and use of covered haul trucks.
Noise and Noise-Compatible Land Use	No	The Project would not increase the number of aircraft operations (i.e. flights) or passenger activity levels; therefore, aircraft noise levels at or surrounding the Airport would not change compared to the No-Action Alternative The Project involves activities consistent and compatible with existing Airport operations. All work would take place within the Airport boundary and would not alter existing off-Airport land use. Construction-period impacts would be minimal and mitigated. Construction mitigation measures include reducing equipment noise through the use of devices such as mufflers, limiting truck idling and keeping exterior construction activities within typical business hours.

Table 4-15 Summary of Impacts and Mitigation Measures/Benefits (Continued)

Environmental Resource[1]	Significant Impact? (Yes/No)	Explanation
Natural Resources and Energy Supply	No	Project construction, operation, and maintenance would cause limited additional demands on energy supplies and other resources that can be accommodated by current power suppliers. Construction activities would temporarily increase energy supply and water demand; Massport anticipates adequate supplies of energy and water available for these activities. Energy saving strategies include using newer technology lighting fixtures such as LED and lighting control system, installing energy efficient heating and cooling systems with energy recovery, efficient motors, fresh air monitoring and reduced pressure loss air handling units, replacing electromechanical relays with software and microprocessor based controls in new elevators, optimizing window to wall ratios, incorporating high performance glass with reduced u-values, increase roof insulation (R-40) and providing external shading.
Climate	No	The Project would have negligible effects on greenhouse gas emissions. The Project would be built to LEED® Commercial Interiors Silver standards. The Project would include energy efficiency and resiliency measures The Project would include energy efficiency (see above) and resiliency measures including having most existing and all new areas above the Design Flood Elevation (DFE), using water resistance and/or waterproof materials in areas exposed to flooding, installing watertight shields on doors, windows and louvers, using exterior and interior membranes and sealants to reduce seepage, seal electrical conduits and other utilities entering below the DFE, installing drainage collection systems and sump pumps, installing early warning devices to monitor water levels, installing backflow preventer valves on drainage and sanitary sewer piping located below the DFE, installing flood openings to equalize the hydrostatic pressure, providing pumps to remove floodwater in non-draining areas and designing equipment and systems for increased extremes of peak heating and cooling degree days.
Historical, Architectural, Archaeological, and Culture Resources	No	The Project would maintain the Our Lady of the Airways Chapel located within Terminal C. No temporary or long-term impacts are anticipated to historical, architectural, archaeological, or cultural resources.
Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)	No	The Project would create a minimal amount of new impervious areas (2,800 SF) as the area is already mostly paved. The Project would include Best Management Practices (BMP's) for improving stormwater treatment and controlling stormwater discharges. The new stormwater system will meet Massport Sustainable Design Guidelines, EPA's NPDES Permit and MassDEP Stormwater Standards. BMPs considered include new deep sump catch basins, infiltration trenches, hydrodynamic separators, oil/water separators and water quality swales. Additionally, roof drainage systems design includes adequate snow retention, gutters and leader systems connected to the existing system and overflow scuppers. Massport would direct stormwater associated with the Project to the existing stormwater system, which discharges to Boston Harbor. Construction mitigation measures will comply with the requirements of the NPDES General Permit for Stormwater Discharges from Construction Activities including filing a Notice of Intent and a Stormwater Pollution Prevention Plan. Massport has developed a dewatering and discharge plan for all construction projects at Logan Airport. If required, groundwater treatment and discharge construction practices would be defined and submitted to MassDEP for approval and implemented during construction. Massport would not discharge storm or groundwater to the sanitary sewer system. There are no wetlands, floodplains, or Wild and Scenic Rivers within the area of the Project footprint[2,3]. Thus only adjacent surface waters are considered.

Table 4-15 Summary of Impacts and Mitigation Measures/Benefits (Continued)

Environmental Resource[1]	Significant Impact? (Yes/No)	Explanation
Hazardous Materials, Solid Waste, and Pollution Prevention	No	The Project includes excavation for foundations and utilities, which may encounter contaminated soils. Short-term construction activities are expected to cause temporary impacts related to solid and hazardous waste. Construction mitigation measures include remediation for all confirmed areas of soil and groundwater contamination per the Massachusetts Contingency Plan, disposing any materials containing oils and hazardous materials in accordance with federal and state regulations, ensuring special handling, dust control and management and disposal of contaminated environmental medial and hazardous building materials, and characterizing and managing any impacted soil that requires export or on-site re-use.
Coastal Resources	No	The Project Area is an entirely developed/disturbed portion of the Airport. Construction would be limited to paved that are already in use for aviation purposes, and would not change the manner of use or quality of land in the coastal zone.
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	No	Several Environmental Justice communities surround Logan Airport. The Project would result in economic benefits related to construction and new goods/services in the form of temporary jobs and on-Airport spending, respectively. The Project would not result in adverse impacts to these communities nor any changes compared to the No-Action Alternative.

1 Environmental resource categories as specified in FAA *Orders 1050.1F* and *5050.4B*.
2 As defined by the Wild and Scenic Rivers Act of 1968, 16 U.S.C. section 1271 et seq.
3 Federal Emergency Management Agency (FEMA) flood insurance mapping.

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5 Regulatory Compliance and Public/Agency Coordination

5.1 Introduction

This chapter discusses the federal and state permits that are anticipated for the Terminal C Canopy, Connector, and Roadway Project (the Proposed Action/the Project), in addition to complying with the National Environmental Policy Act (NEPA). It also identifies Massport's ongoing efforts to coordinate with agencies, as well as inform the public.

5.2 Regulatory Compliance

Table 5-1 lists anticipated state and federal permits required for the Project along with the status of the permits and other approvals. Subsequent sections describe how the Project will comply with these regulatory requirements.

Table 5-1 Anticipated Permits and Approvals

Issuing Agency	Approval or Permit	Status
Federal Aviation Administration	Airport Layout Plan Approval	Approval to be issued
	Finding of No Significant Impact (FONSI)	Environmental Assessment (EA) submitted herein
Federal Aviation Administration	Air Quality General Conformity Determination	Determination presented in this document. See Chapter 4, *Environmental Consequences*
Federal Aviation Administration	14 CFR Part 77, Form 7460-1 Construction or Alteration Requiring Notice	As required prior to construction

Table 5-1 Anticipated Permits and Approvals (Continued)

Issuing Agency	Approval or Permit	Status
U.S. Environmental Protection Agency Region 1	National Pollutant Discharge Elimination System (NPDES) Individual Permit	The Project will meet the standards included in Logan Airport's individual NPDES permit (No. MA0000787).
	NPDES Construction General Permit	Construction-related; a stormwater pollution prevention plan will be developed by the contractor
Massachusetts Contingency Plan (MCP)	Hazardous materials encountered during the development would be addressed in accordance with applicable MCP regulations	As required

5.2.1 Airport Layout Plan Approval

Massport prepared this Environmental Assessment (EA) because it is seeking Federal Aviation Administration (FAA) approval for a modification of the Airport Layout Plan (ALP), which includes the components of the Proposed Action—the Terminal C Canopy, Connector, and Roadway Project. The ALP approval is a federal action that requires review pursuant to NEPA, as described in FAA *Order 5050.4B*.[1] FAA's approval of the ALP will incorporate modifications to landside and airside facilities, building footprints, and roadways associated with the Proposed Project.

5.2.2 National Environmental Policy Act (NEPA)

The FAA has determined that the Project proposed by Massport (as the Sponsor) requires an EA under NEPA due to requisite changes to the Logan Airport Layout Plan. This EA identifies project alternatives and documents the potential environmental effects associated with the construction and operation of the proposed terminal and roadway improvements at Logan Airport. Massport does not expect the Proposed Action to result in significant environmental impacts such as increased aircraft activity, vehicle traffic, additional noise, or air emissions. Based on its review of the comments on the EA or, if additional information is needed to make a determination, FAA may pursue further review under NEPA.

5.2.3 Air Quality/General Conformity Determination

As documented in Chapter 4, *Environmental Consequences*, Section 4.3.2, *Air Quality*, the Terminal C Canopy, Connector, and Roadway Project would be in conformance with the General Conformity Rule, established under the Clean Air Act, as related emissions would be within *de minimis* thresholds. The Proposed Action will not change the aircraft operational levels at Logan Airport nor will it alter ground-based aircraft movements (i.e., taxi and delay periods) or result in increased surface transportation traffic. Therefore, operational emissions (mobile and stationary source) will not change due to the Project and therefore no *de minimis* thresholds would be exceeded.

Construction activities are expected to generate short-term construction-related air emissions, including exhaust emissions from on-road construction vehicles, off-road construction equipment, evaporative emissions from

1 FAA. 2006. *Order 5050.4B: National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions.*

asphalt placement and curing, and the generation of fugitive dust from disturbance of unpaved areas. A quantitative assessment of air quality for construction is not warranted based on the short-term nature (lasting less than five years) of the construction activities. Project-related emissions would be projected to be substantially below federal General Conformity *de minimis* thresholds. In addition, the project activities fall under the list of activities "Presumed to Conform" by the FAA according to the July 30, 2007, Federal Register.[2] The Proposed Action is presumed to conform, falling primarily under categories *4. Aircraft Gate Areas on Airside 6. Terminal and Concourse Upgrades* and *7. New HVAC Systems, Upgrades, and Expansions*.

As part of the approvals process associated with the Terminal C Canopy, Connector, and Roadway Project and to minimize air emissions, Massport will require all contractors to comply with certain construction guidelines that relate to:

- Construction vehicle/equipment anti-idling;
- Retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters; and
- Construction worker vehicle trip management, including encouraging contractors to provide off-Airport parking, and use high-occupancy vehicle transportation modes for employees.

5.2.4 FAA Part 77 Notification

In administering Title 14 of the Code of Federal Regulations (CFR) Part 77, the prime objectives of the FAA are to promote air safety and the efficient use of the navigable airspace. [3] To accomplish this, an evaluation of aeronautical surfaces with respect to structure heights are conducted based on information provided by project proponents to complete a FAA Form 7460-1, Notice of Proposed Construction or Alteration. The 14 CFR Part 77.9 states that any person/organization who intends to sponsor any construction or alterations on any public use airport, regardless of height, and listed in the Airport Directory must notify the Administrator of the FAA by submitting this form. Massport will submit a FAA Form 7460-1 as needed prior to construction of the Project.

5.2.5 National Pollutant Discharge Elimination System (NPDES) Permits

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. Point sources are discrete conveyances such as pipes or man-made ditches. The NPDES program includes permitting for municipal, industrial, and construction-related sources of pollution under general or individual permits. The Project must meet the standards included in Logan Airport's individual NPDES permit (No. MA0000787), which allows Massport to discharge stormwater from outfalls on the Airport property. All project elements will be designed to meet the standards of Logan Airport's NPDES individual permit.

The Project would also require completion and submittal of a Stormwater Notice of Intent to the U.S. Environmental Protection Agency (EPA) for coverage under the NPDES Construction General Permit for stormwater discharge from construction activities because the Project will require disturbance of over one acre. The Permit requires the development and implementation of a Stormwater Pollution Prevention Plan that

2 Federal Register (72 FR 415), *Federal Presumed To Conform Actions Under General Conformity*, Federal Aviation Administration, July 30, 2007.
3 14 CFR Part 77: http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=14:2.0.1.2.9

includes specific sedimentation and erosion control measures that will be implemented for the entire duration of construction activities. Proper implementation of the SWPP will ensure that no adverse impacts would occur from construction-related runoff. Mitigation measures included in Logan Airport's existing SWPP to minimize sedimentation and erosion are described in Chapter 4, *Environmental Consequences*.

5.2.6 Massachusetts Contingency Plan (MCP)

During construction, the soil and groundwater contamination issues surrounding the existing terminal facilities and terminal area roadways will be addressed, as needed, in compliance with the Massachusetts Contingency Plan (MCP). In compliance with the MCP, a Soil Management Plan may be required to determine whether any excavated soils that are generated through foundation construction, improvements to the fuel hydrant system or construction of the terminal area roadways can be reused onsite, and/or determine requirements for off-site reuse, recycling, or disposal. Soil will be disposed of in conformance with Massport's soil management policy. A Soils Management Plan will be developed under the supervision of a Massachusetts Licensed Site Professional and will be integrated into the requirements of existing Response Action Outcomes for portions of the site covered by Release Tracking Numbers and/or Release Abatement Measures plans for any newly identified areas of contamination. The Soils Management Plan would be developed in concert with a groundwater management plan, which will address requirements for dewatering and collection, testing and/or treatment, and disposal or discharge of water pumped from excavations, if required.

5.3 Public and Agency Coordination

During the preparation of this EA and on an on-going basis, Massport coordinates with the FAA and other federal, state, and local agencies.

5.3.1 Public Involvement

Public outreach and community input is an important element of Massport's overall environmental review processes. Community and agency outreach and coordination will continue through permitting, design, and construction of the Terminal C Enhancement Project.

Massport described the Proposed Project in the publicly-circulated *2016 Logan Airport Environmental Data Report (EDR)*, published in May 2018.[4] Massport posts information about key regulatory filings on its website and the Draft EA was first made available on October 31, 2018. The EA and all supporting documentation can be found along with Massport's most recent environmental filings, at http://www.massport.com/massport/about-massport/project-environmental-filings.

While an EA public meeting is not mandatory as part of the NEPA process, at FAA's request, an informational meeting on the Draft EA was hosted by Massport during the 30-day NEPA public comment period which ran from November 1 to November 30, 2018. The public meeting was held on November 13, 2018 at 6:30 PM in the Cathy Leonard MacLean Community Room at the Logan Rental Car Center.

4 Massport. 2018. *Boston-Logan International Airport 2016 Environmental Data Report.* May 15, 2018. http://www.massport.com/massport/about-massport/project-environmental-filings/. Accessed May 24, 2018.

Public notices of EA availability and the meeting were published in the Boston Herald on November 2, 2018. English and Spanish notices were also published in the East Boston Times on November 7, 2018. Regulatory agencies, organized community groups interested in airport activity, and local residents were notified of the meeting either as part of the Draft EA cover letter or Notice of Availability. The goal of the meeting was to acquaint reviewers and the community with the Project, including construction schedule/activities, and to solicit input regarding project issues.

At the conclusion of the public comment period, FAA and Massport received two written comments. Copies of the comment letters are included in Appendix D of this EA.

5.3.2 Agency Consultation and Coordination

Since this Project is located within an existing Airport area that is currently in active aviation use, there are no new impacts to natural resources within the Project footprint. As such, there are no anticipated adverse long-term impacts that would require Massport to consult with resource agencies regarding potential impacts, avoidance, and minimization of impacts. Massport distributed this EA to local, state, and federal agencies for their review and comment (see Chapter 6, *Distribution List*). Massport will coordinate with agencies, if needed, regarding affected environmental resources and potential impacts. Massport has disclosed the Project to the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) by way of the Massachusetts Environmental Policy Act (MEPA) Office through the *2016 EDR*. A MEPA Office representative was invited to the Project public meeting.

As included in Appendix D of this EA, the Massachusetts Natural Heritage and Endangered Species Program (NHESP) advised Massport that they had reviewed the Draft EA. Based on the information presented in the Draft EA, NHESP determined that all proposed activities, inclusive of staging and access, are located outside of Priority Habitat of State-listed species and therefore they had no formal comments on the project.

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6 Distribution

Federal Aviation Administration (FAA) *Order 5050.4B* states that airport development will trigger public interest. Distributing this Environmental Assessment (EA) to the public is the best way to provide the public with the information needed to formulate an opinion. FAA *Order 5050.4B, Paragraph 804,* requires distribution to the federal agencies having jurisdiction by law or regulation over the action and to the public for review. The following is a list of recipients of the Draft EA, including representatives of governmental agencies, community groups, and local residents interested in activities at Logan Airport. **The 'P' indicates that Massport sent a printed copy. The 'N' indicates that Massport sent a notice of availability.**

This EA is available on Massport's website (www.massport.com). Persons may request limited printed copies of this EA from Michael Gove, telephone: (617) 568-3546, email: mgove@massport.com. Electronic and printed copies of the EA are available for review at the following public libraries.

	Library	Address		Library	Address
P	Boston Public Library Main Branch	700 Boylston Street Boston, MA 02116	P	Boston Public Library East Boston Branch	365 Bremen Street East Boston, MA 02128
P	Winthrop Public Library	2 Metcalf Square Winthrop, MA 02151			

Federal Government

- United States Senators and Representatives

P The Honorable Edward J. Markey
JFK Federal Building, Suite 975
Attn: Rory Clark
15 New Sudbury Street
Boston, MA 02203

P The Honorable Katherine Clark
U.S. House of Representatives
701 Concord Avenue, Suite 101
Cambridge, MA 02138

P The Honorable Stephen F. Lynch
Attn: Joe King
U.S. House of Representatives
One Harbor Street, Suite 304
Boston, MA 02210

P The Honorable Elizabeth Warren
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15 New Sudbury Street
Boston, MA 02203

P The Honorable Michael E. Capuano
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110 First Street
Cambridge, MA 02141

- Environmental Protection Agency

P Tim Timmerman
U.S. Environmental Protection Agency
New England Region
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Mail Code ORA 17-1
Boston, MA 02109-3912

P EPA New England (Region 1)
Attn: NPDES Permit Division
5 Post Office Square – Suite 100
Boston, MA 02109

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Federal Aviation Administration
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P Christine Kirby, Director
Air and Climate Division
Department of Environmental Protection
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- Senate/House of Representatives

P Senate President Karen Spilka
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Boston, MA 02133

P Senator Joseph Boncore
Chair, Joint Committee on Transportation
Massachusetts State House, Room 112
Boston, MA 02133

P Representative Adrian Madaro
Massachusetts State House, Room 544
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P Speaker of the House Robert A. DeLeo
Massachusetts State House, Room 356
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  220 Morrissey Boulevard
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City of Boston
One City Hall Square
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Boston Transportation Department

[P] Gina Fiandaca, Commissioner
Boston Transportation Department
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Boston Redevelopment Authority

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Boston Environment Department

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Winthrop, MA 02152

- Other

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Boston Harbor Now
15 State St #1100
Boston, MA 02109

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7 List of Preparers

7.1 Introduction

The Terminal C Canopy, Connector, and Roadway Project (the Proposed Project/the Project) Environmental Assessment (EA) was prepared by the Massachusetts Port Authority (Massport). Technical analyses and documents were prepared by a team of technical consultants. The entities involved, as well as the personnel and their individual areas of responsibility, are listed below. The years of experience for each individual are listed in parentheses as well as their qualifications.

7.2 Massport

Name/Years of Experience	Education
Stewart Dalzell, Deputy Director Environmental Planning and Permitting Project Manager (40)	B.S., Biology

7.3 FAA

Name/Years of Experience	Education
Richard Doucette Environmental Program Manager (29)	B.S., Parks and Recreation Management M.S., Natural Resources Management and Administration

7.4 VHB

VHB served as the lead consultant responsible for the preparation of the EA.

Name/Years of Experience	Education
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Laura Castelli, EIT – Project Manager (19)	B.S., Civil Engineering
Ana Fill, PE – Senior Transportation Engineer (21)	B.S., Civil and Environmental Engineering M.S., Civil Engineering MBA
Heidi Richards, PE – Senior Air Quality and Transportation Engineer (27)	B.S., Civil Engineering
Quan Tat, EIT – Senior Air Quality and Transportation Engineer (22)	B.S., Civil Engineering
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7.5 Stantec

Stantec supported the development of the entire document.

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7.6 Gensler

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7.7 Fennick McCredie

Fennick McCredie supported the development of the entire document.

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Sharon Reynolds, AIA – Deputy Project Manager (15)	B.Arch.
Jenniece Centrella – Senior Project Designer (20)	B.Arch.
Sean Flanagan - LEED Green Associate (7)	M. Arch.

7.8 PGAL

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7.9 WSP

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7.10 Arup

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7.11 Caminiti Consulting

Caminiti consulting supported the development of the entire document.

Name/Years of Experience	Education
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TERMINAL C CANOPY, CONNECTOR, AND ROADWAY PROJECT
Boston-Logan International Airport
East Boston, Massachusetts

Appendices

- Appendix A, *FAA Memorandum: Terminal B Access Roadway Bridge Reconstruction*
- Appendix B, *Surface Transporation*
- Appendix C, *Air Quality*
- Appendix D, *Comment Letters on Draft Environmental Assessment*

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Appendix A

FAA Memorandum: Terminal B Roadway Bridge Reconstruction

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TO: Richard Doucette, Lisa Lesperance (FAA)

FROM: Stewart Dalzell

CC: Flavio Leo, David Doane, Laura Castelli (VHB)

SUBJECT: **Logan Terminal B Access Roadway Bridge Reconstruction**

DATE: February 22, 2018

As we discussed at our meeting today, Massport will begin to advance design for the replacement of the existing bridge section that forms a segment of the primary upper-level access roadway serving Terminal B (see Figure 1). That section of the bridge was constructed in the 1960s; in recent years it has required ongoing maintenance and repairs (see Figure 2) and to maintain safe conditions now requires replacement. Replacement is expected to take several months and Massport would like to start that construction this spring in advance of the larger planned program to modify the roadways between Terminals B & C and upgrade the connections and passenger areas primarily between Terminals B & C. We understand that the larger roadway and terminal improvements will need to be addressed in an *Environmental Assessment* (EA) and that these time-sensitive early repairs will be referenced in the EA. We will be back to your shortly to discuss the scope of that EA.

Since the proposed bridge section replacement would of itself not require NEPA review (no ALP change or FAA funding involved), we understand that Massport can move forward with that work; this memorandum is intended to provide a written record of these discussions and we agree to include this memorandum as an attachment to the forthcoming EA. The bridge replacement project will not require any MEPA, City of Boston or MassDOT review/approvals.

Massport will need to maintain full access to Terminal B during construction. As illustrated in the attached Figure 3, to maintain full access during construction, we will need to build some temporary roadway sections to bypass the bridge segment; a portion of an existing ramp will also be demolished to make way for the temporary access roadways. Once the bridge repairs are complete, the temporary roadways will be removed. It is possible that as design for the larger project advances, Massport may find some additional utility for a section of the temporary roadway; in this case, that section of the roadway would become part of the larger EA project and fully addressed in that document.

Based on our current schedule, we would hope to begin these repairs by June for expected completion in 3-4 months.

Terminal B Access Roadway Bridge: Existing Conditions

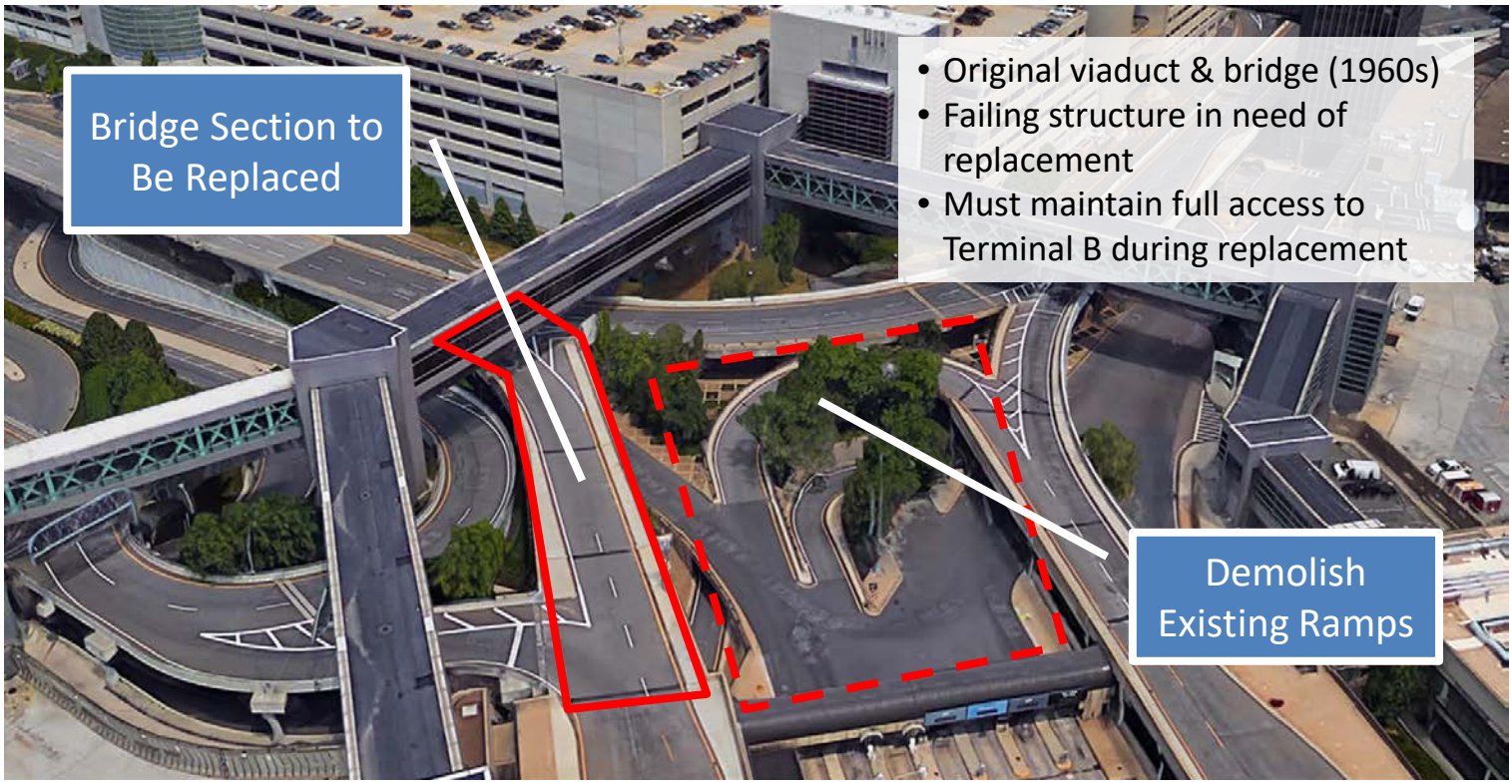
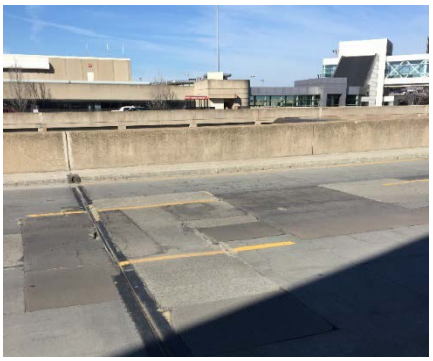


FIGURE 1

Photographs of Existing Conditions (2/21/18)



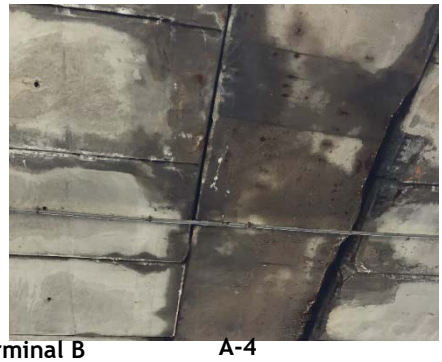


FIGURE 2

Temporary Terminal B Access Roadways

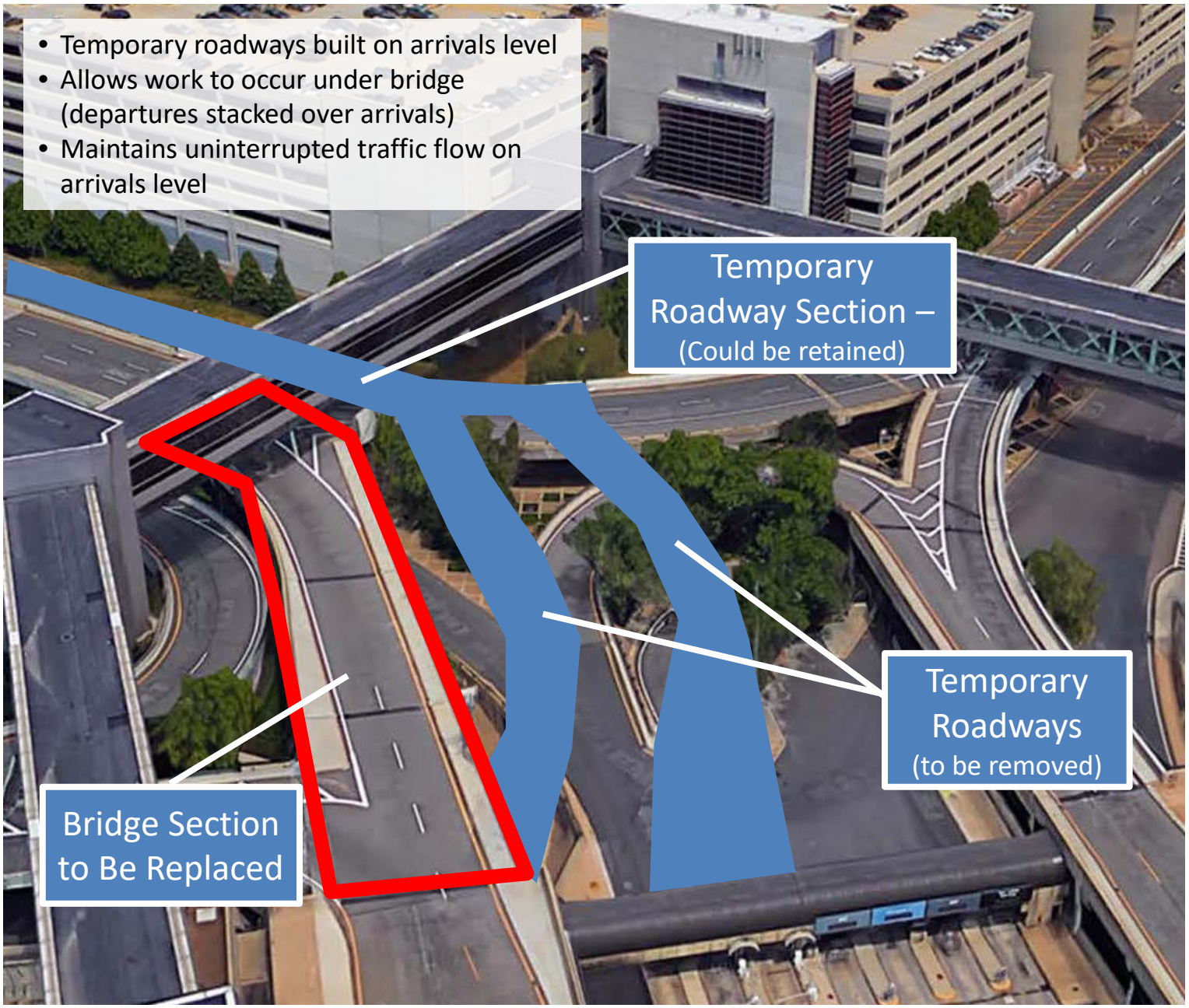


FIGURE 3

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Appendix B

Surface Transportation

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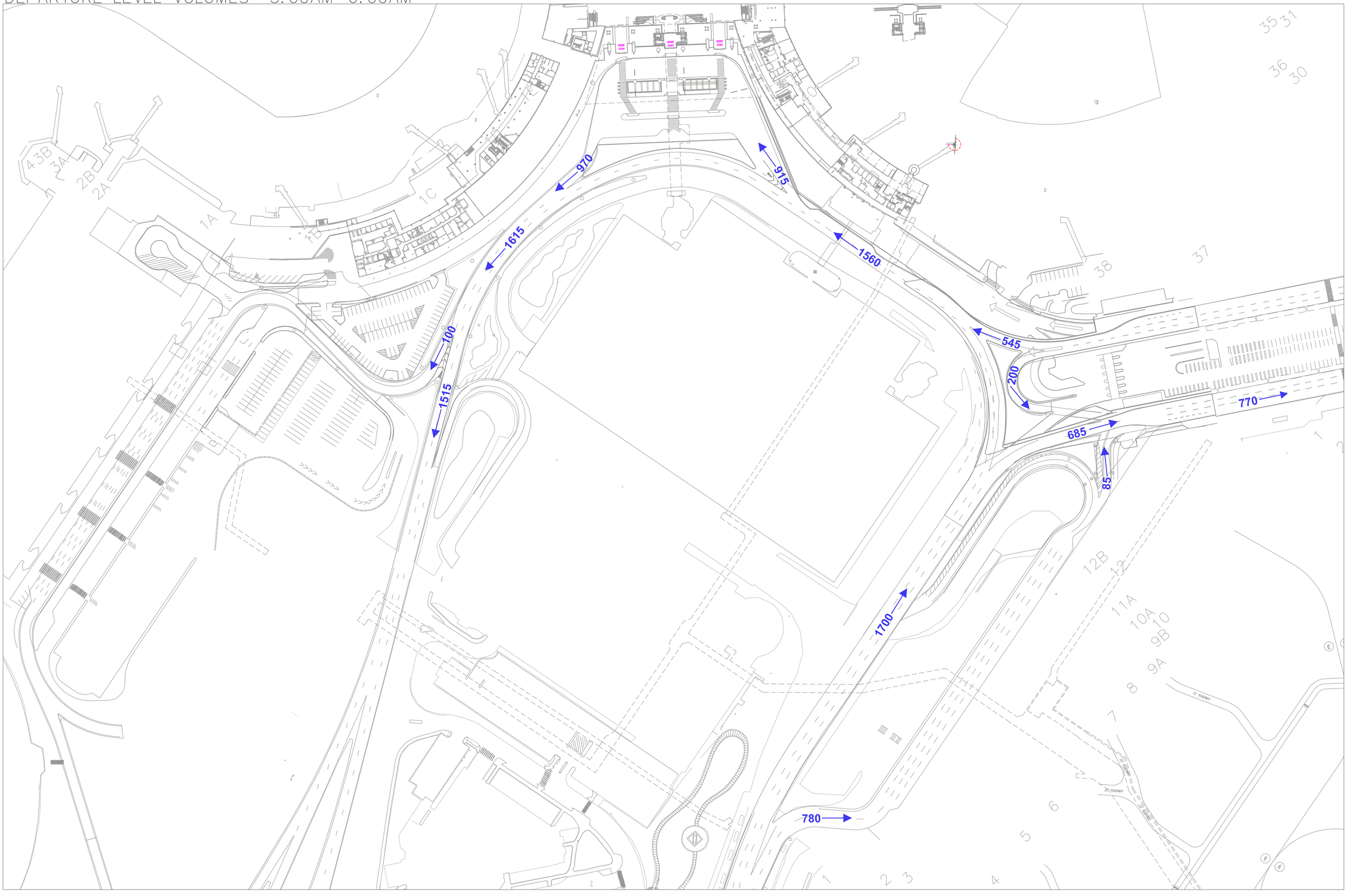
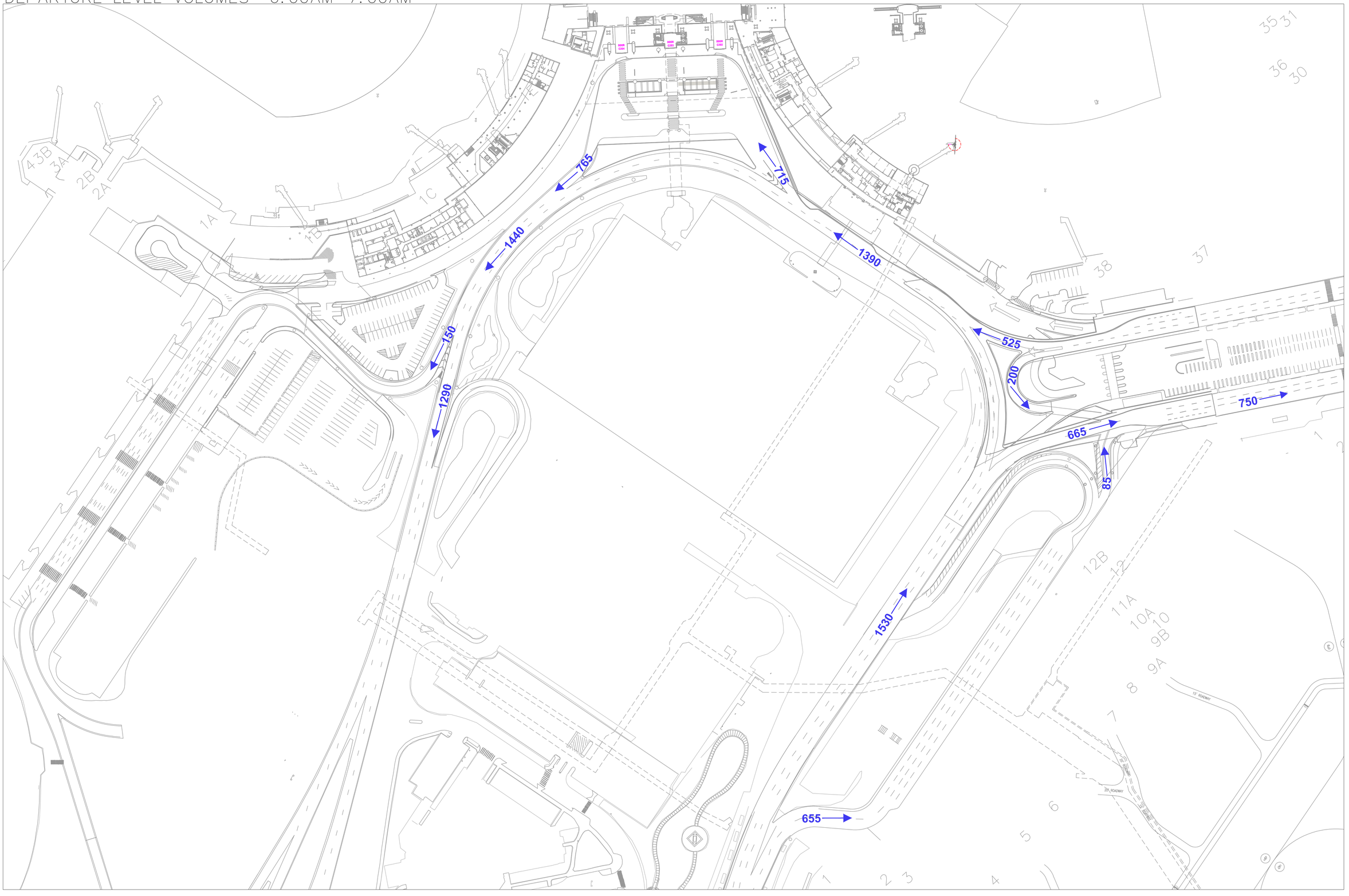
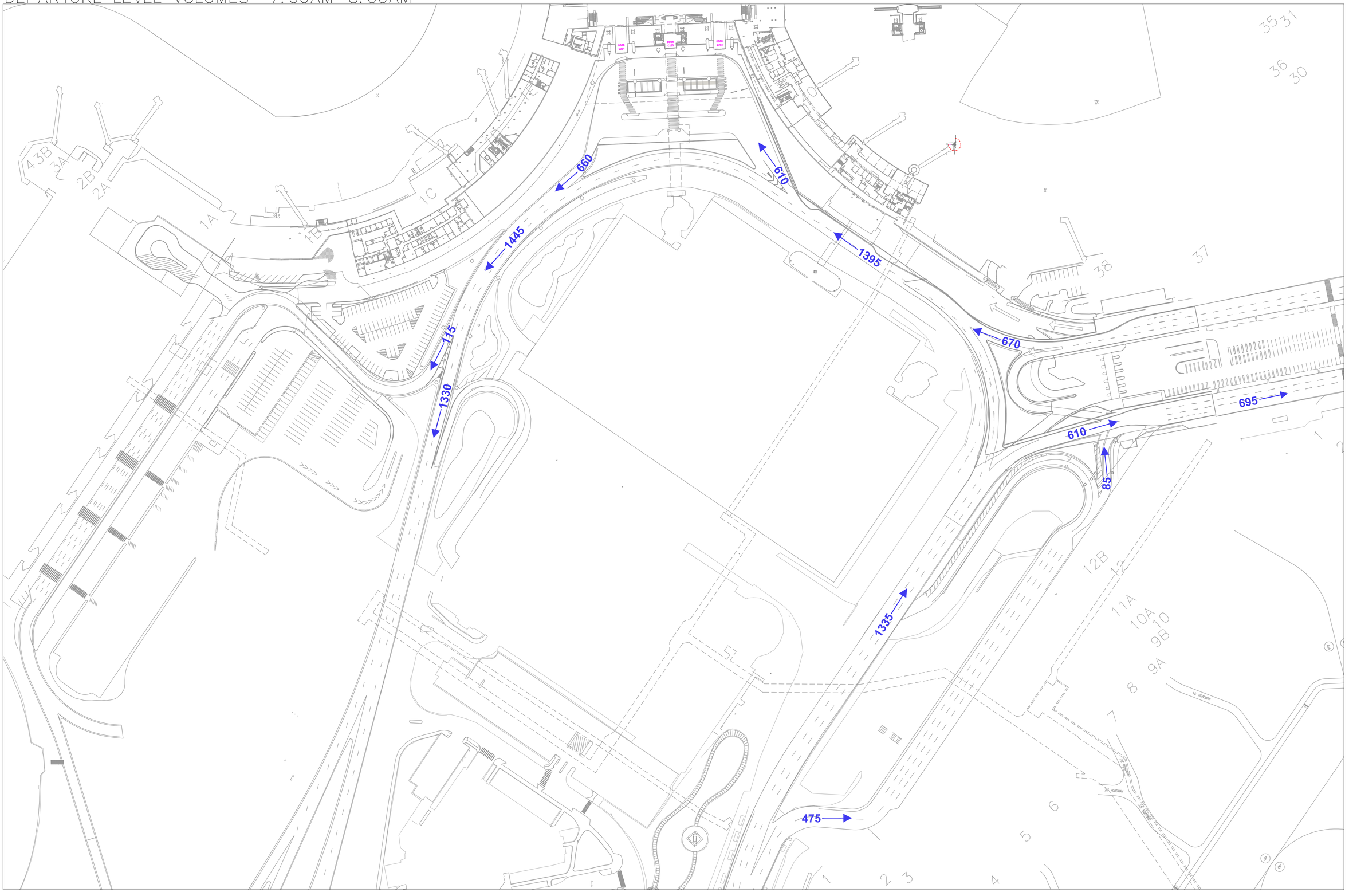
DEPARTURE LEVEL VOLUMES 5:00AM–6:00AM



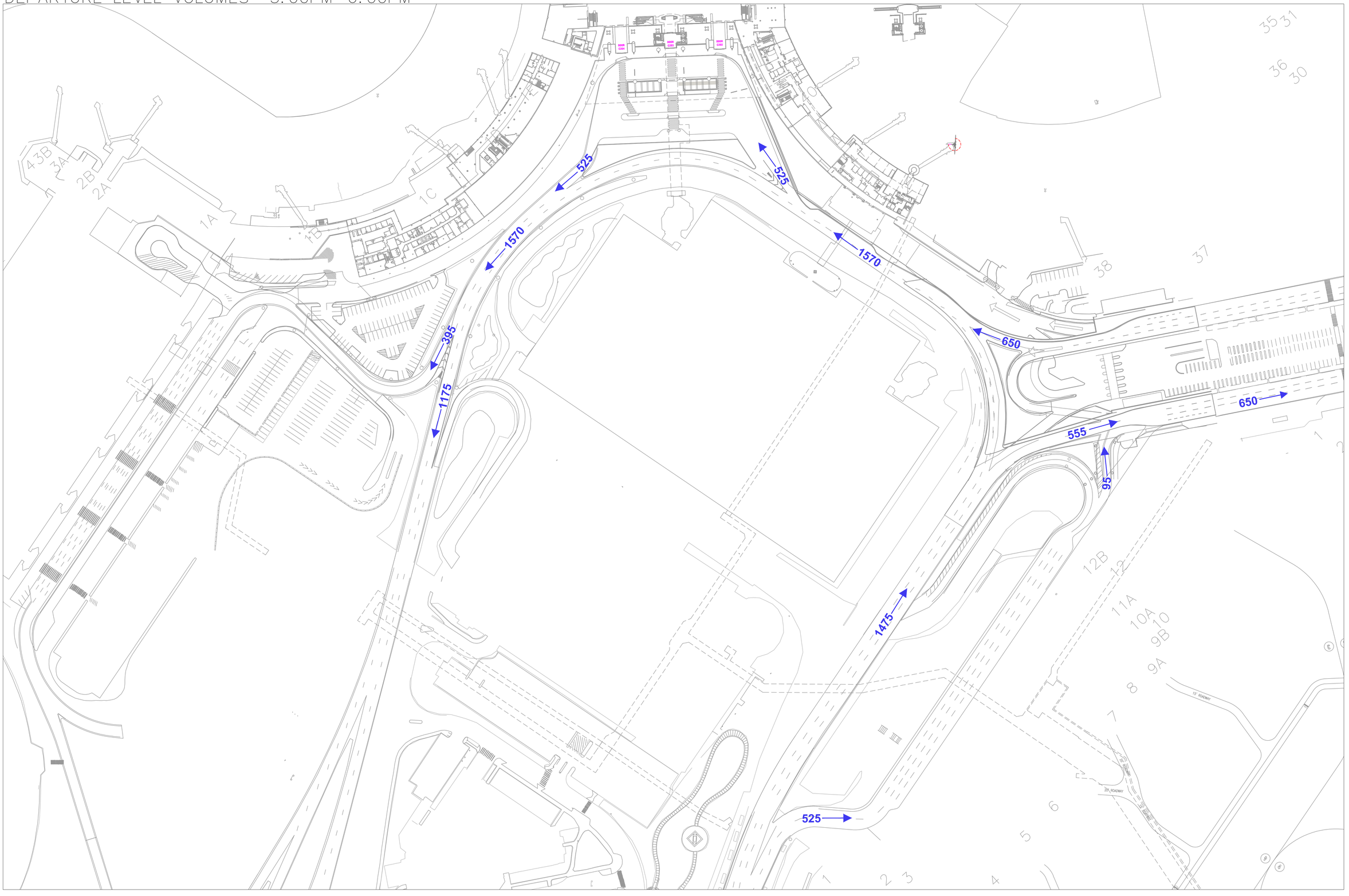
DEPARTURE LEVEL VOLUMES 6:00AM–7:00AM



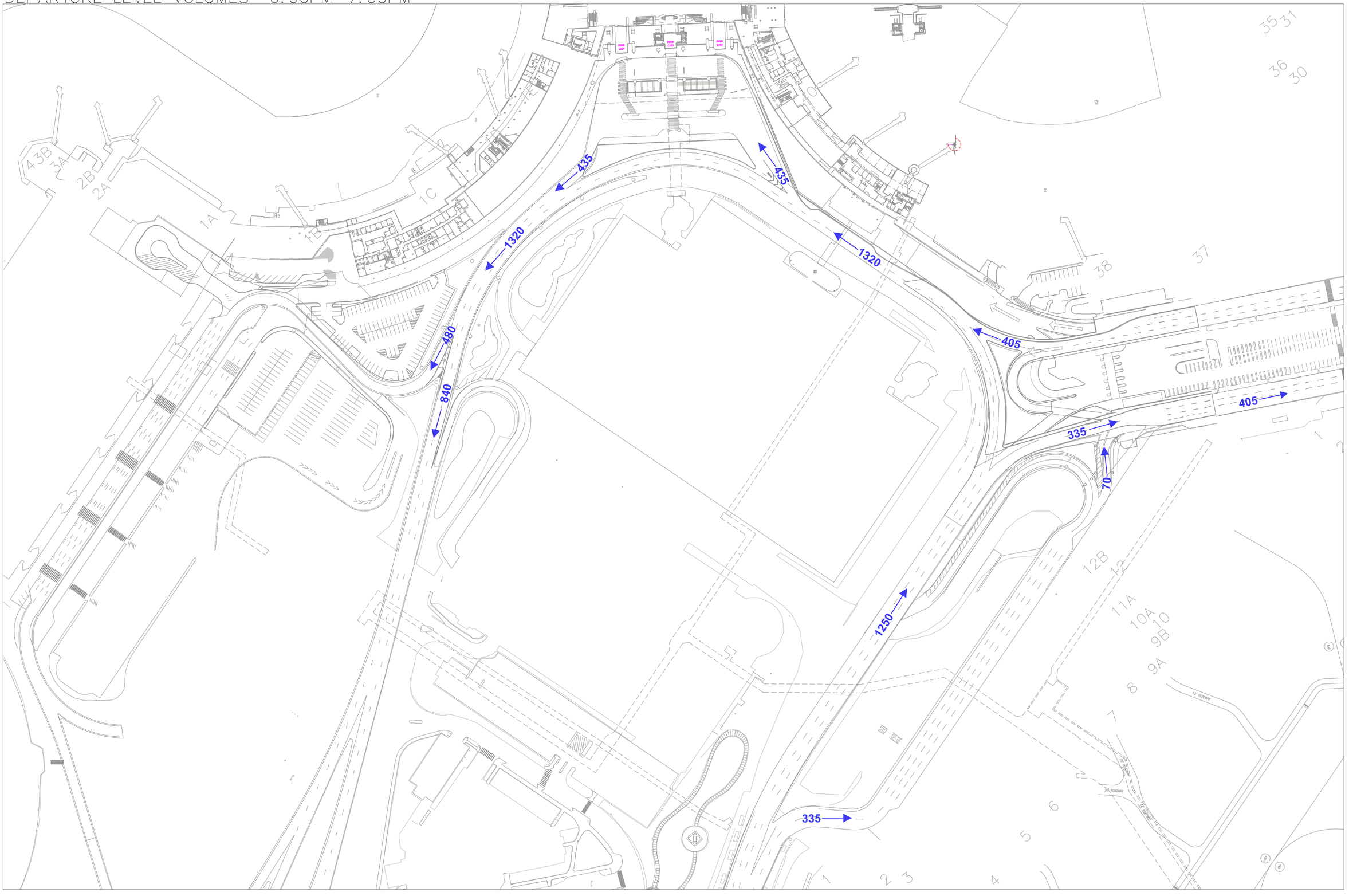
DEPARTURE LEVEL VOLUMES 7:00AM–8:00AM



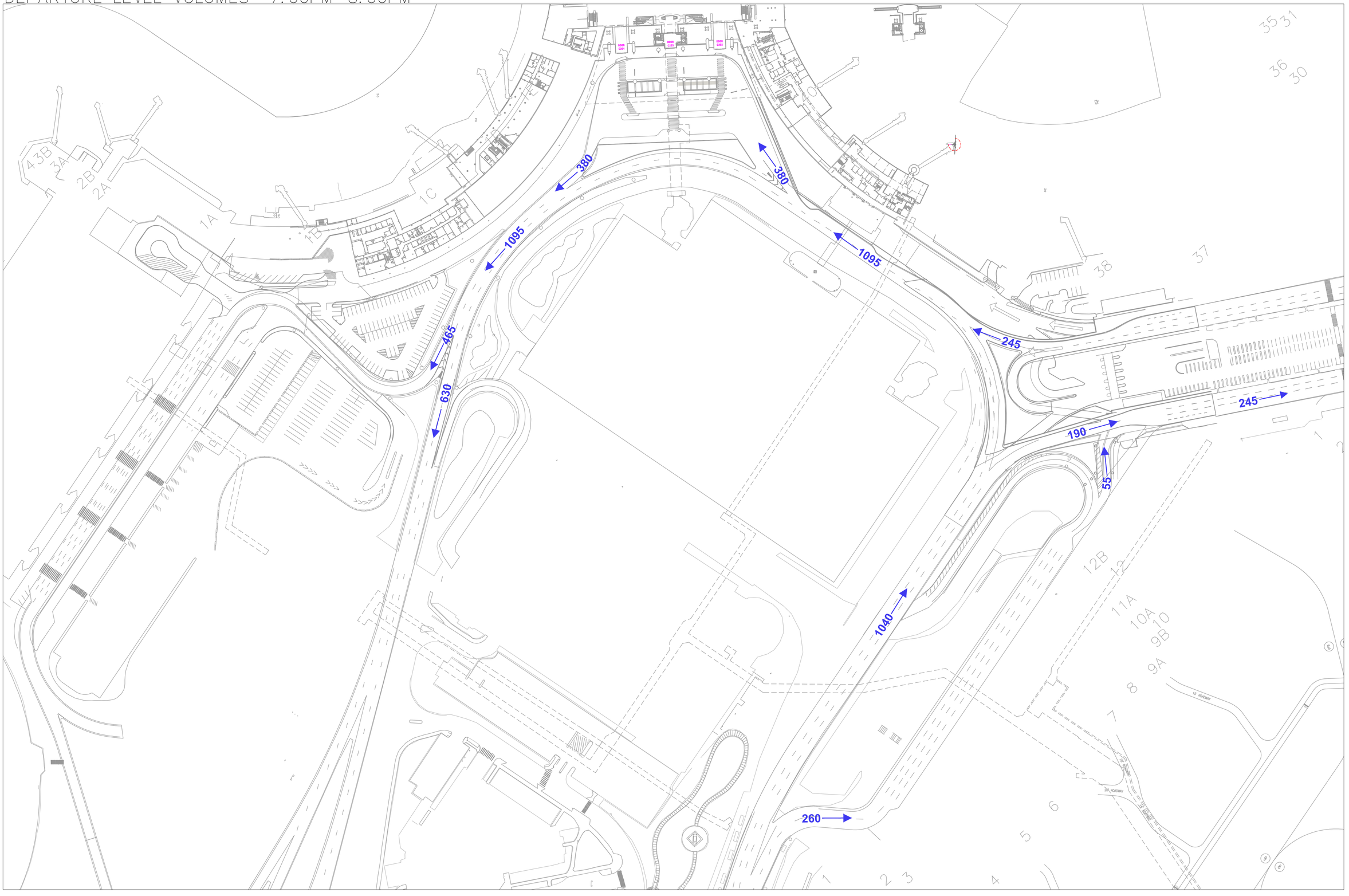
DEPARTURE LEVEL VOLUMES 5:00PM–6:00PM



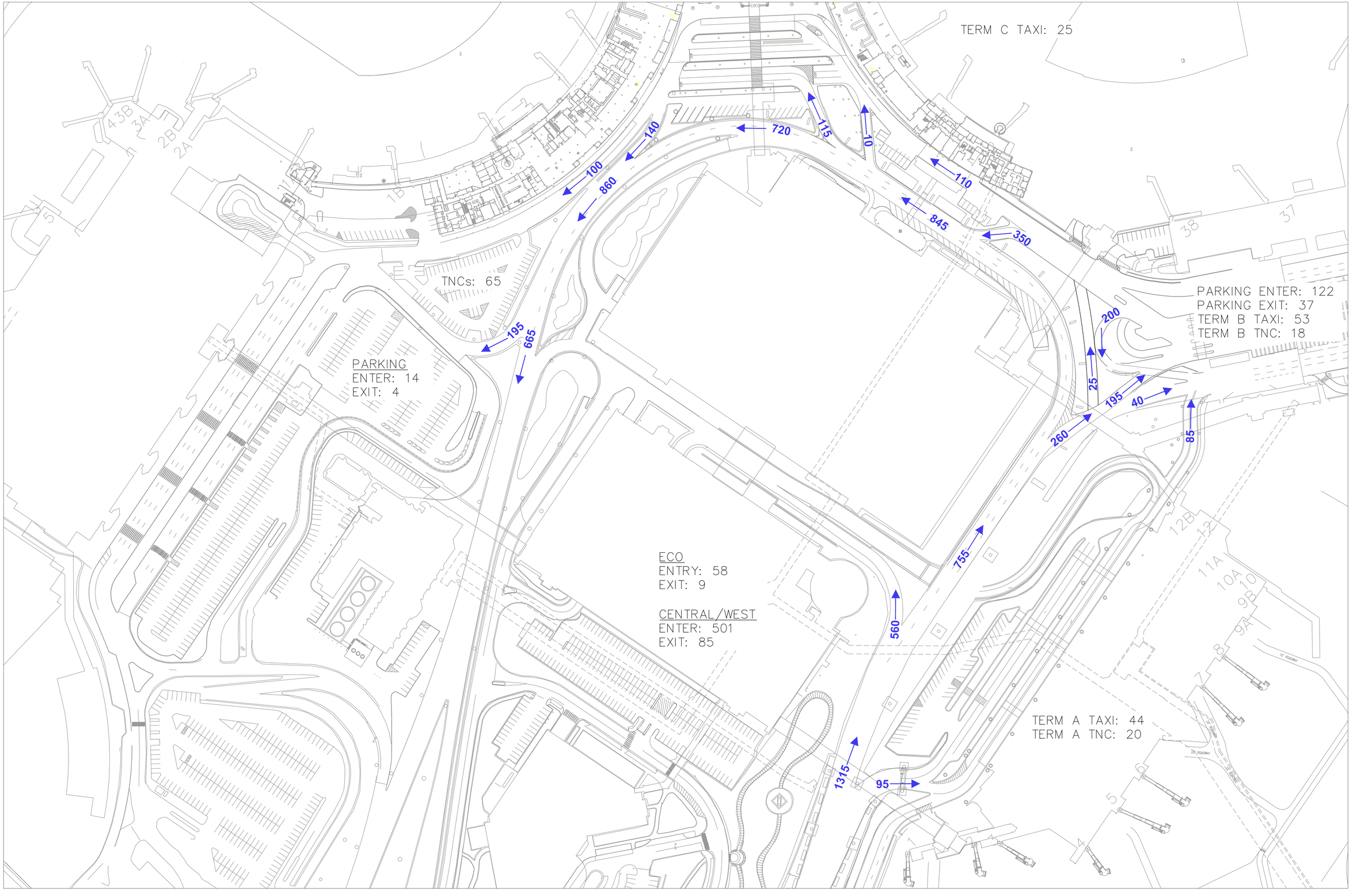
DEPARTURE LEVEL VOLUMES 6:00PM–7:00PM



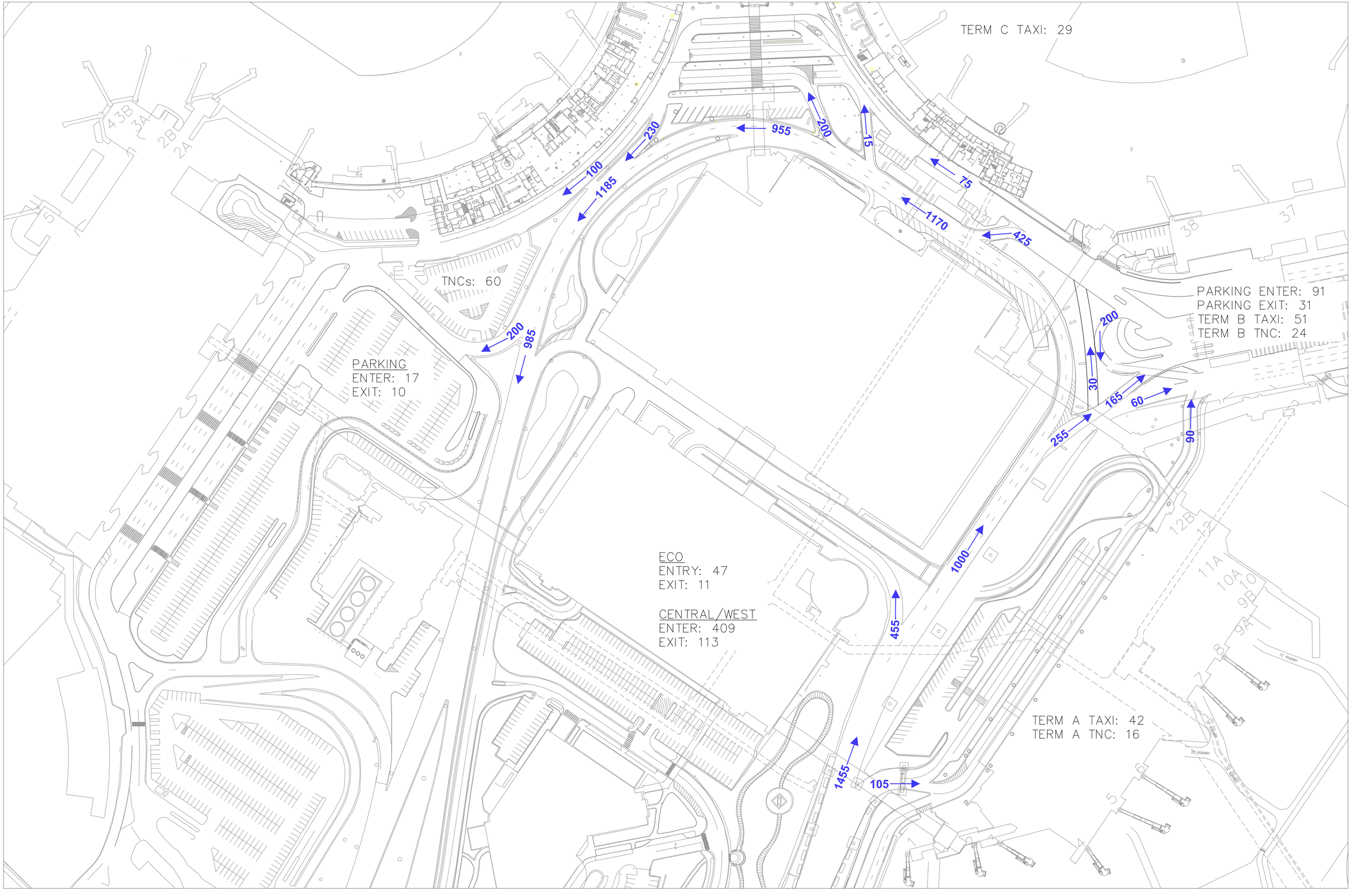
DEPARTURE LEVEL VOLUMES 7:00PM–8:00PM



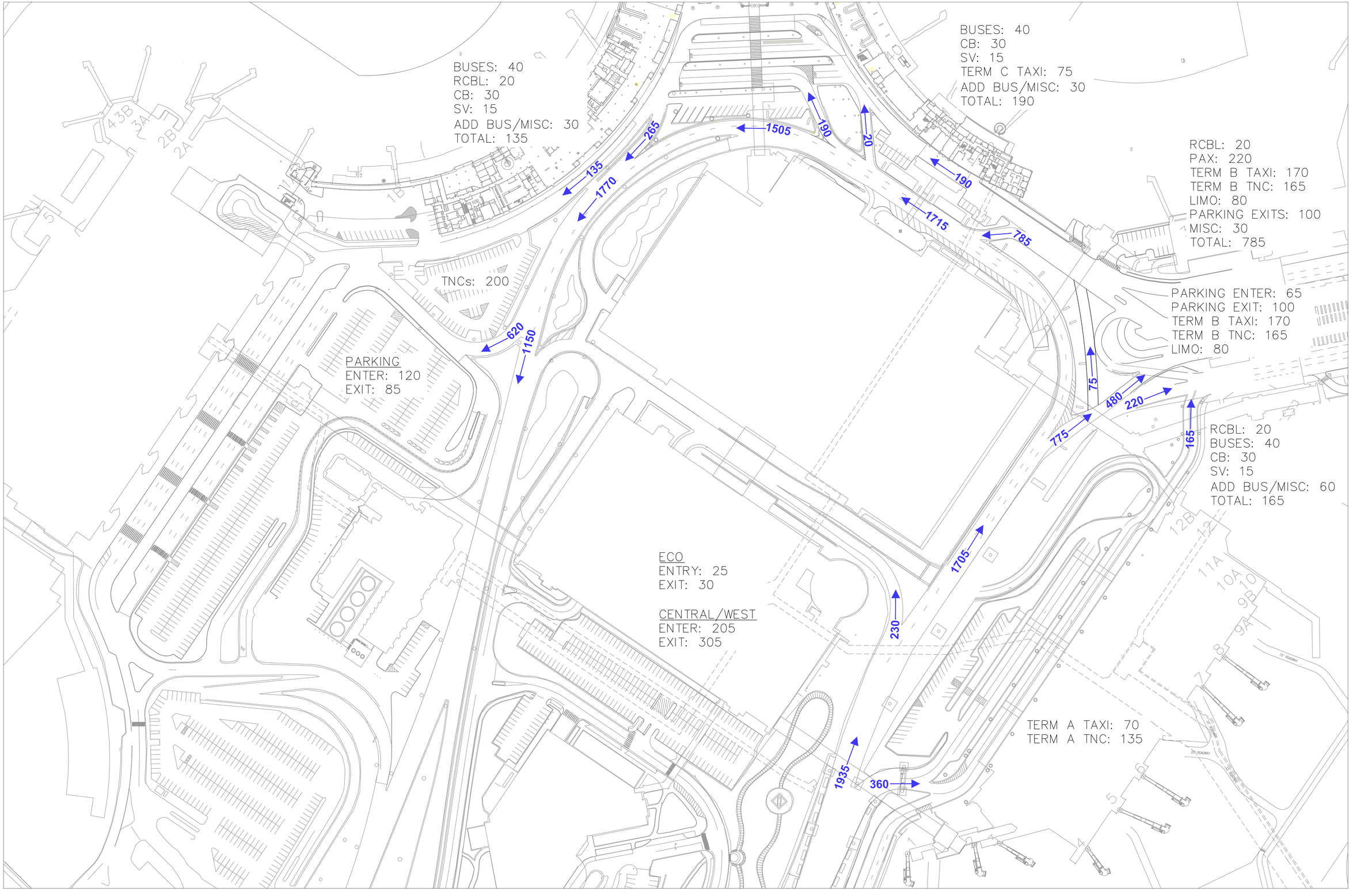
ARRIVAL LEVEL VOLUMES 5:00AM–6:00AM



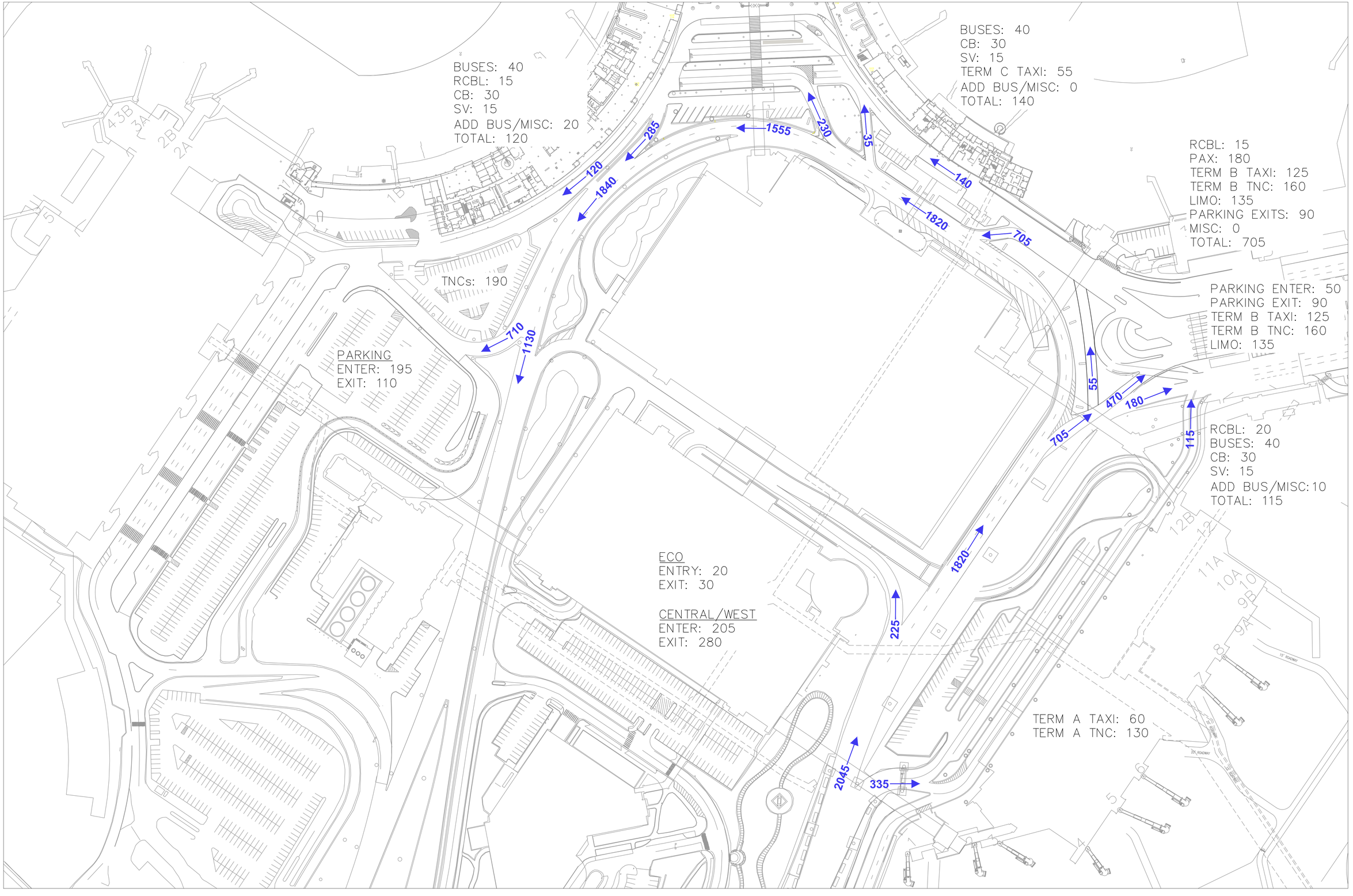
ARRIVAL LEVEL VOLUMES 6:00AM–7:00AM



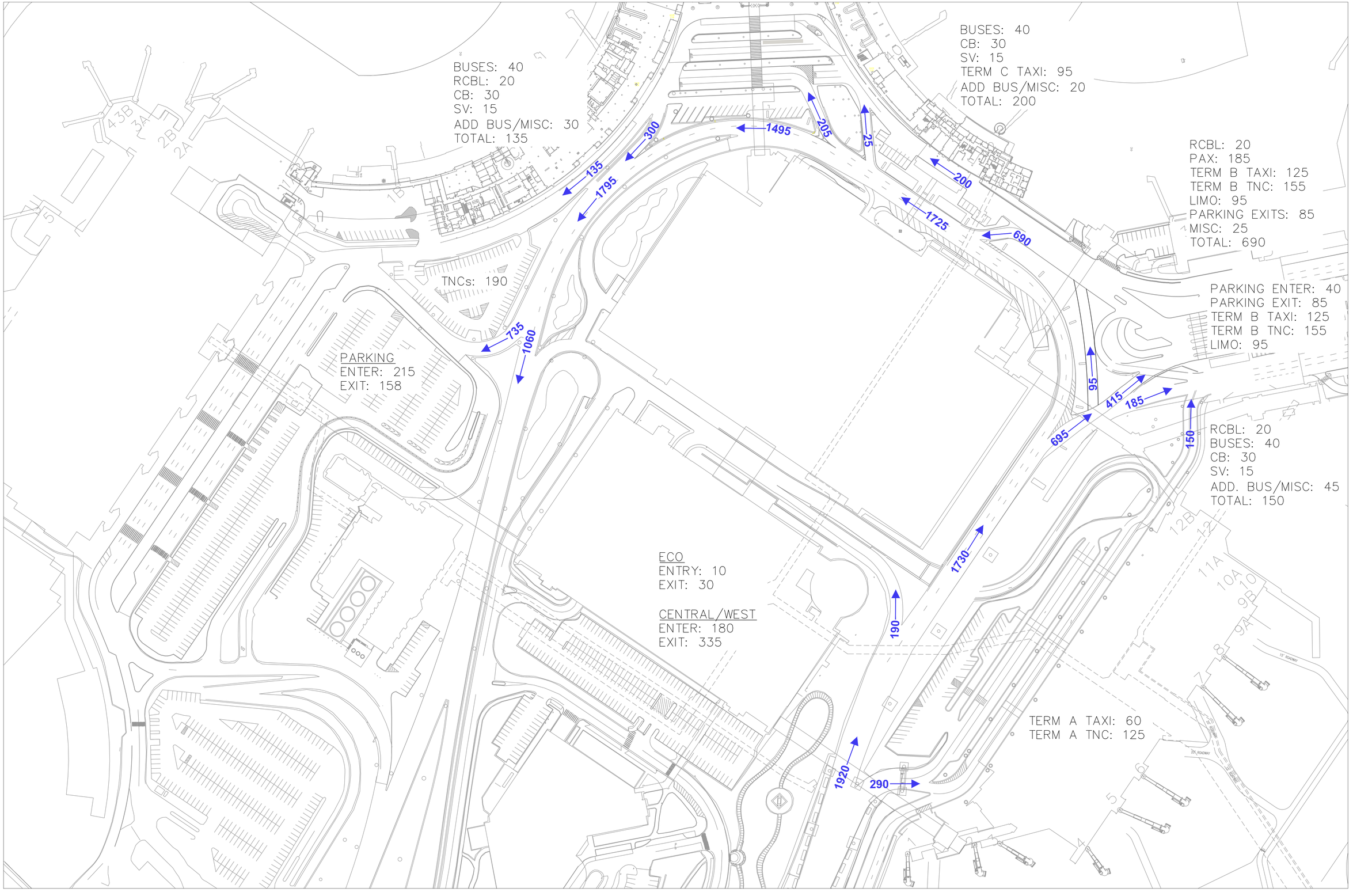
ARRIVAL LEVEL VOLUMES 5:00PM–6:00PM



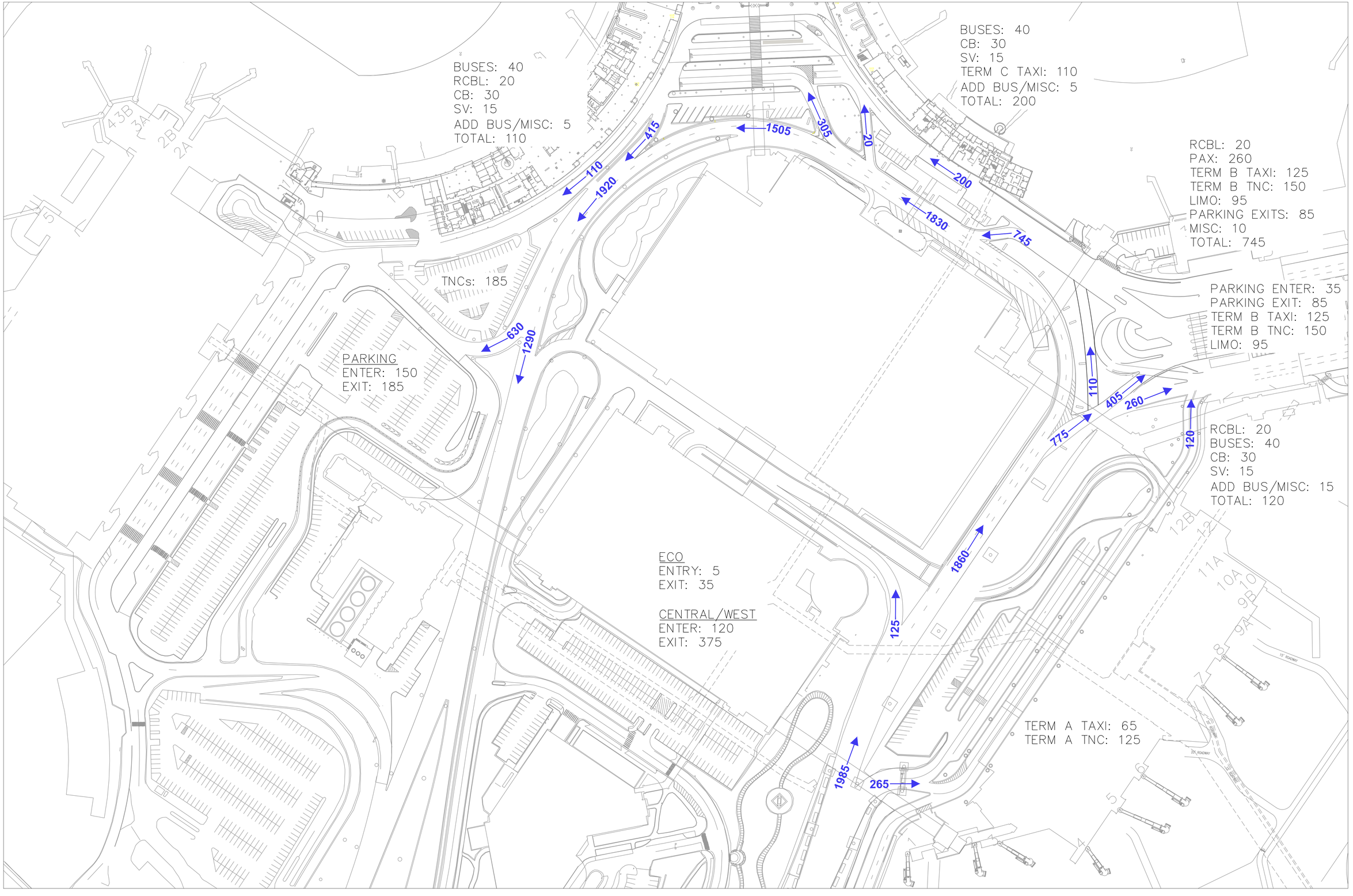
ARRIVAL LEVEL VOLUMES 6:00PM–7:00PM



ARRIVAL LEVEL VOLUMES 7:00PM–8:00PM



ARRIVAL LEVEL VOLUMES 8:00PM–9:00PM



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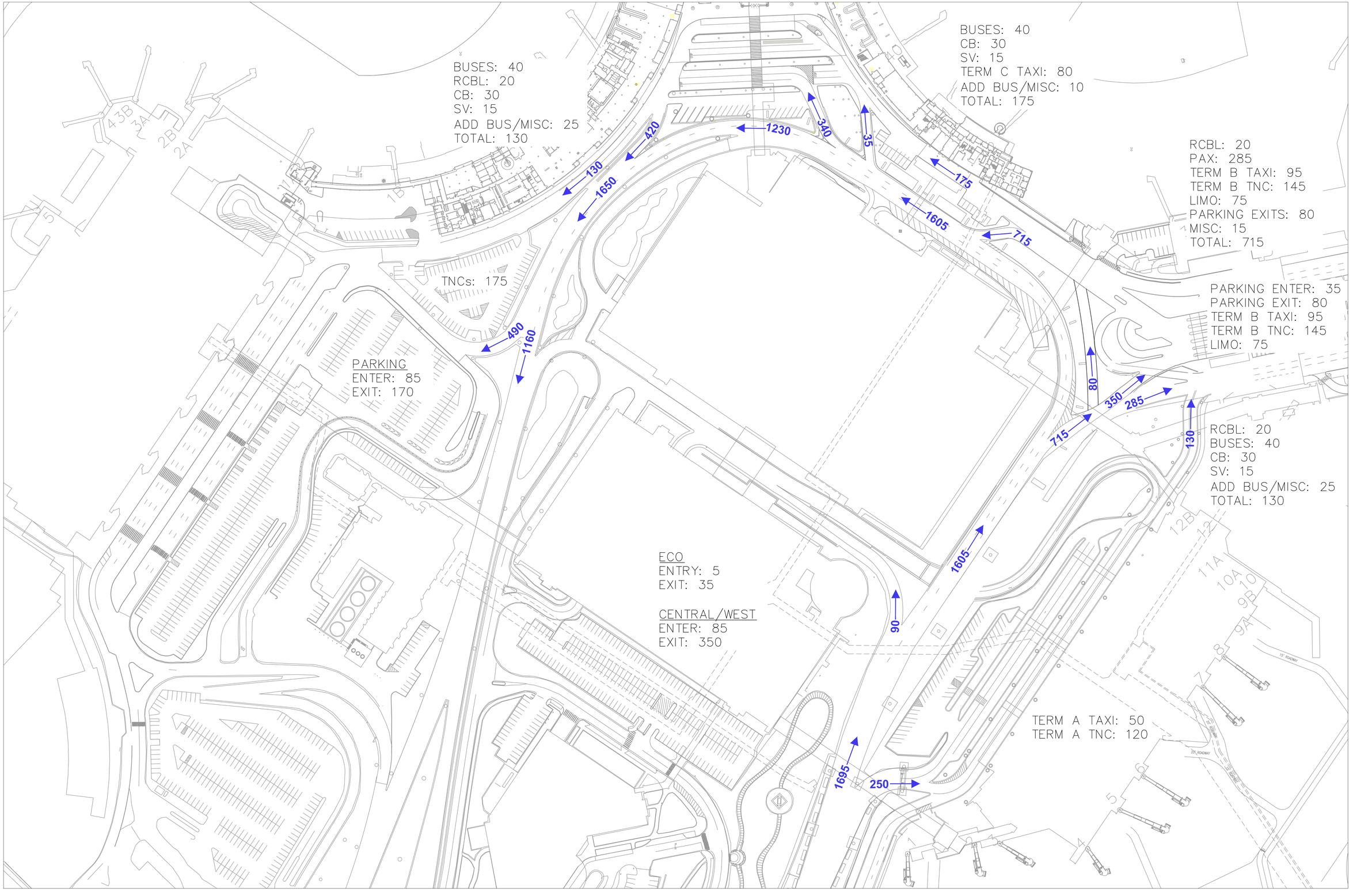
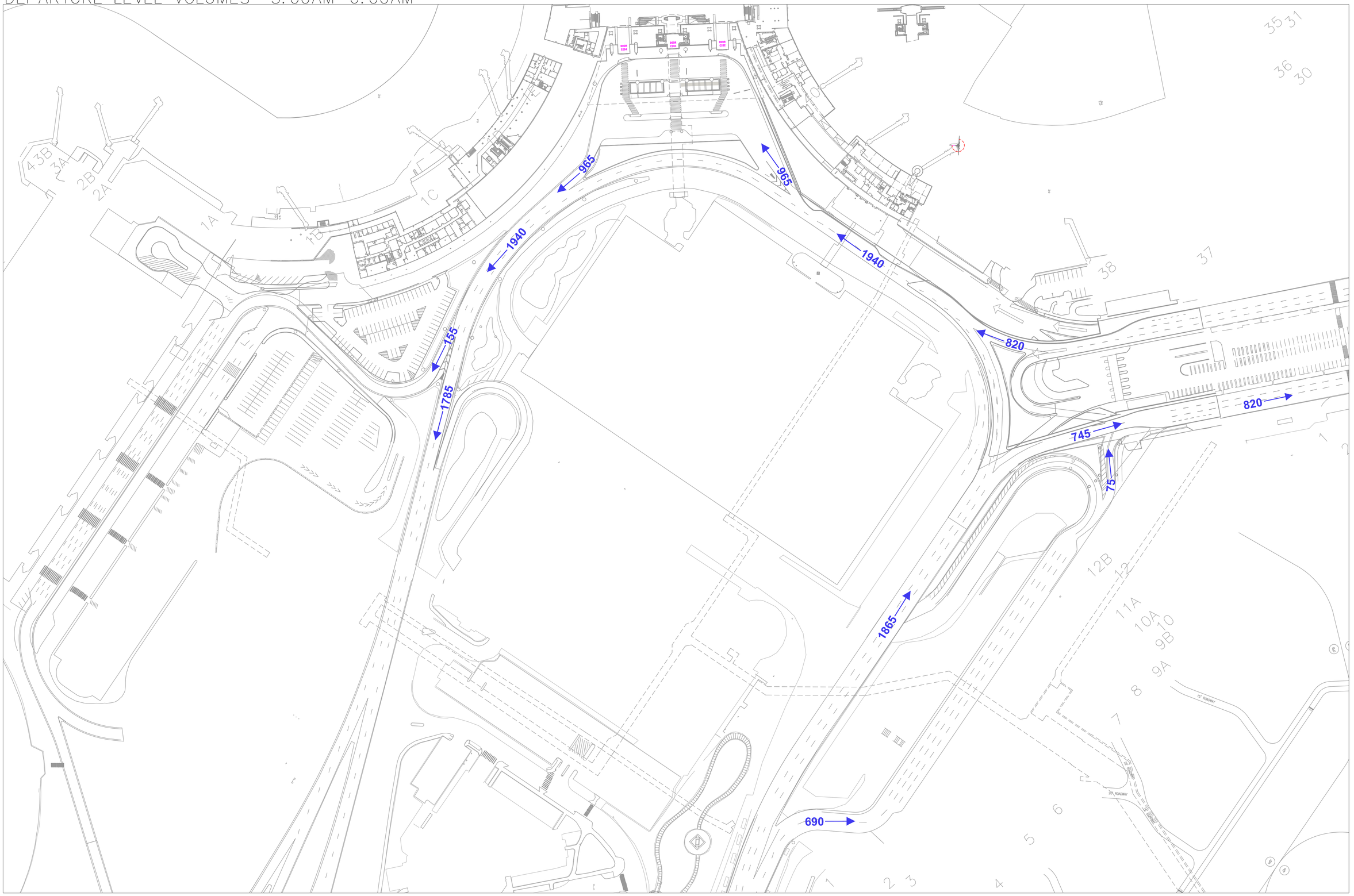
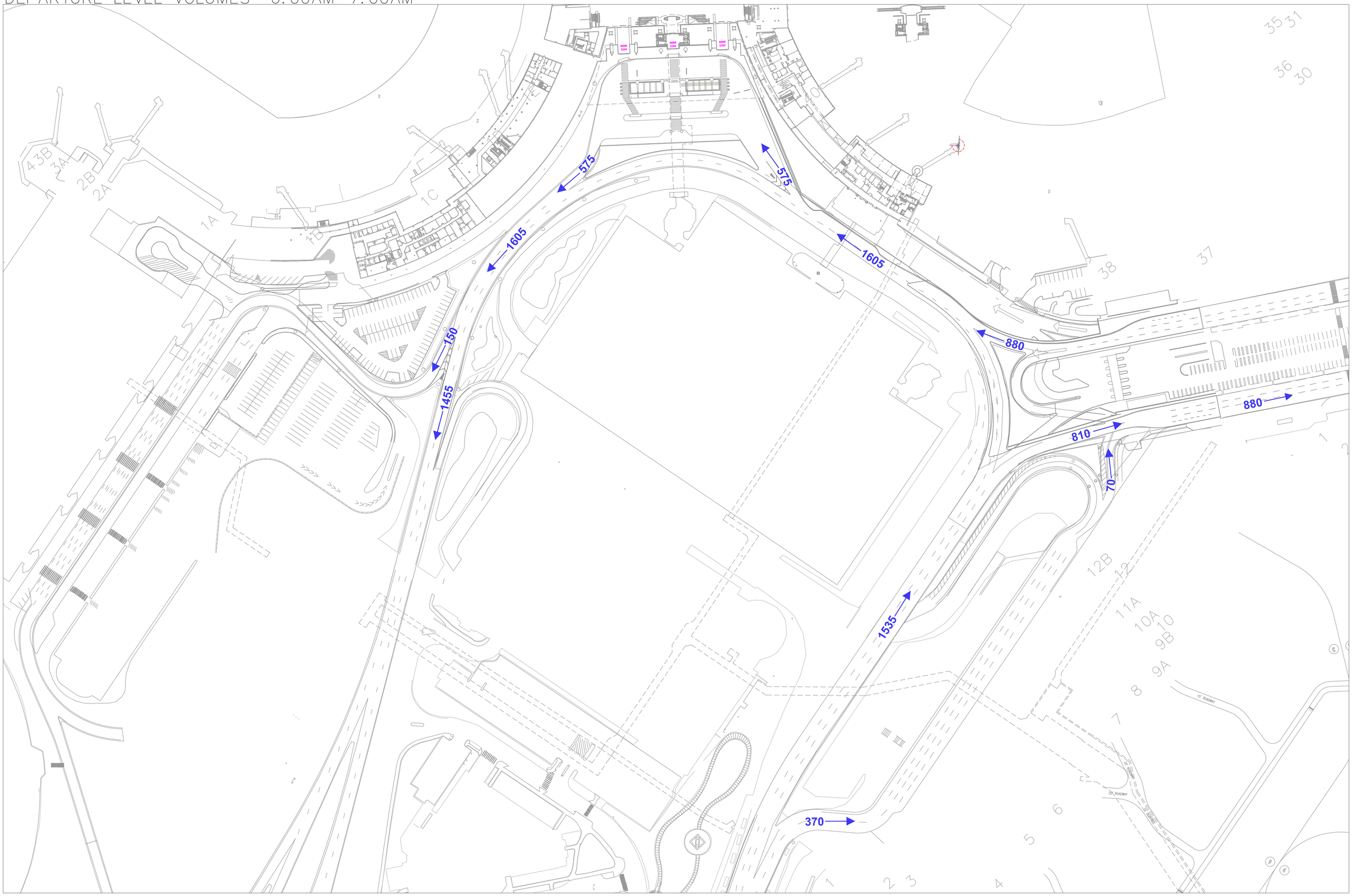


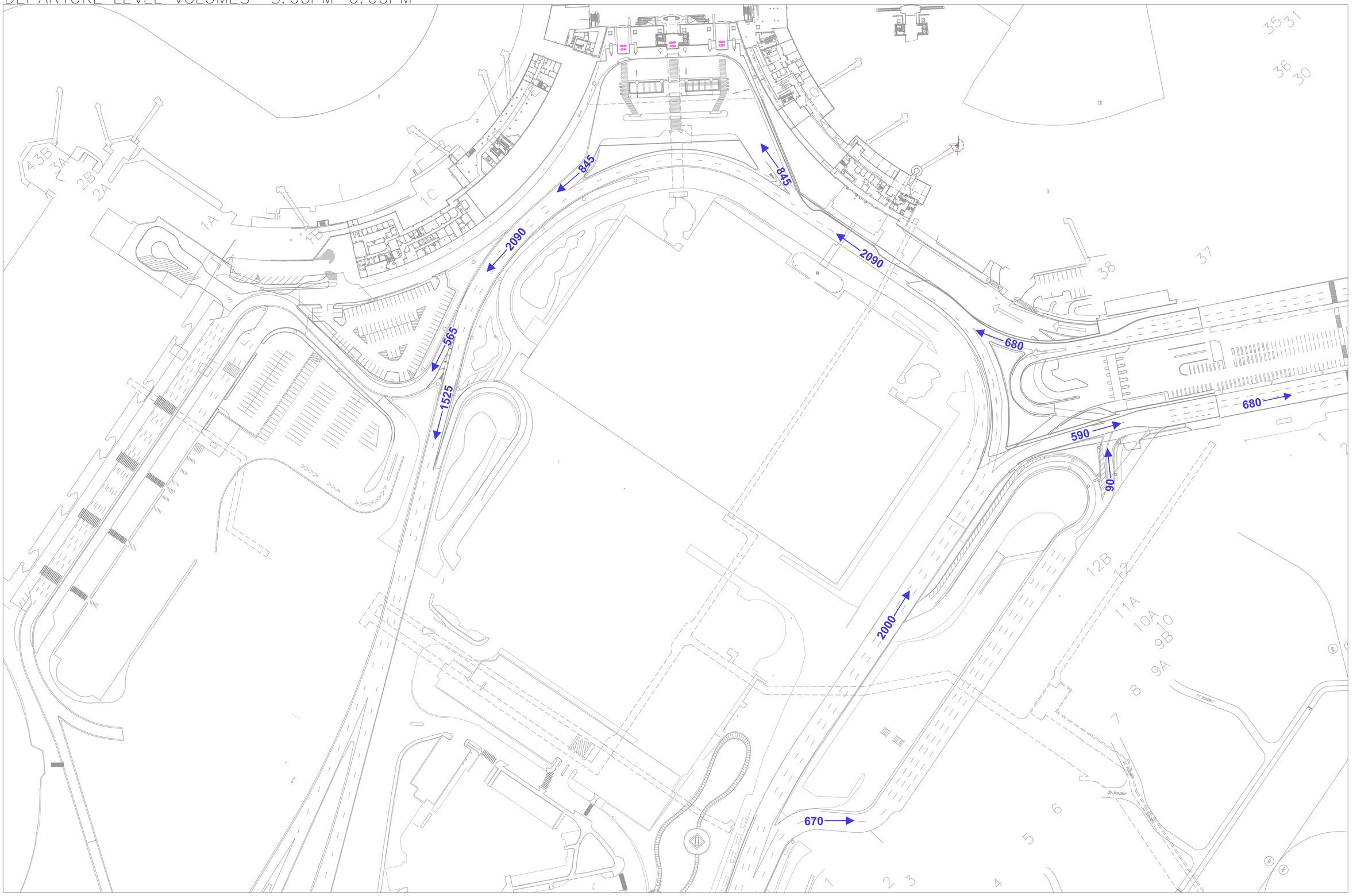
DEPARTURE LEVEL VOLUMES 5:00AM–6:00AM



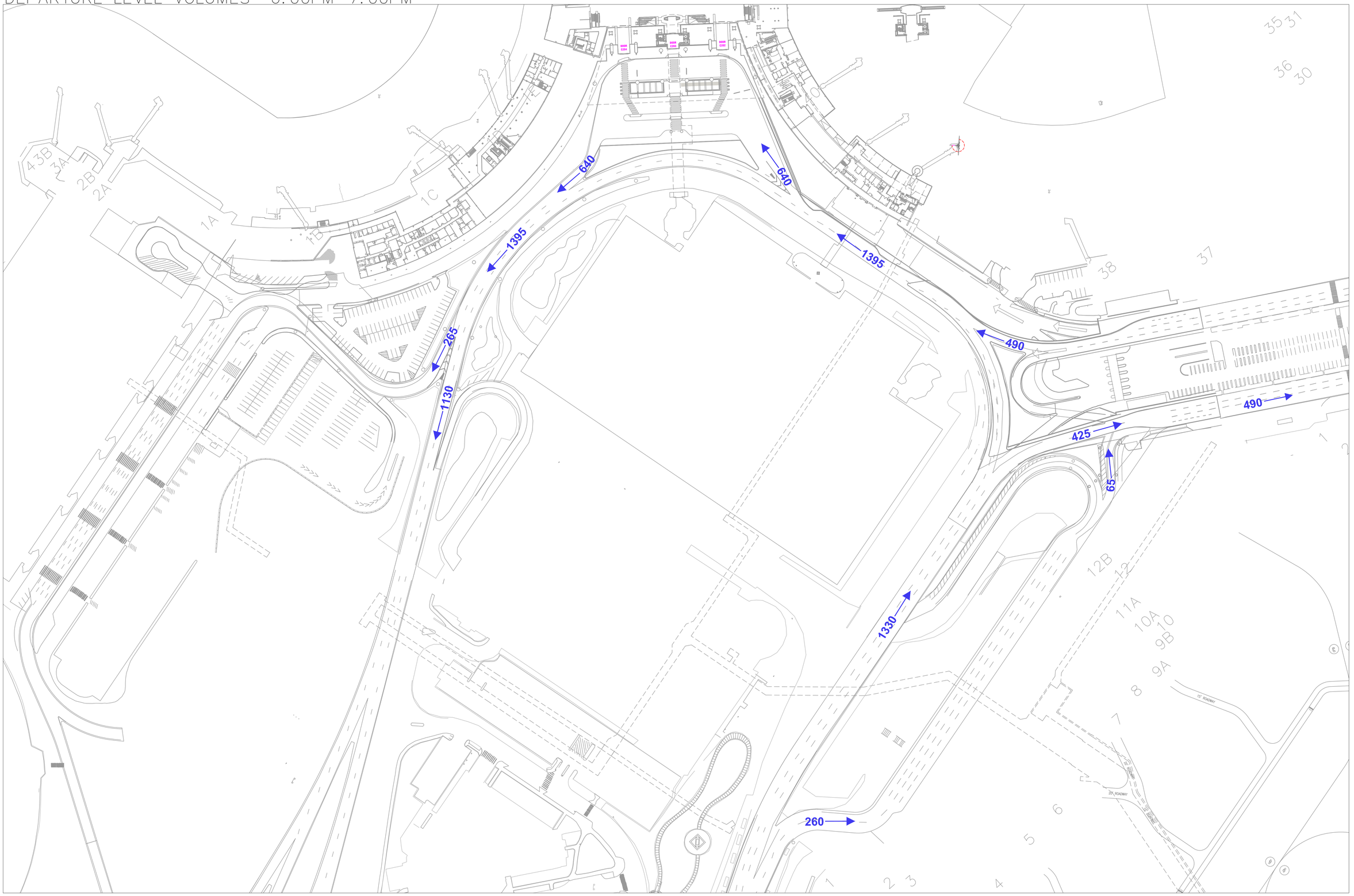
DEPARTURE LEVEL VOLUMES 6:00AM–7:00AM



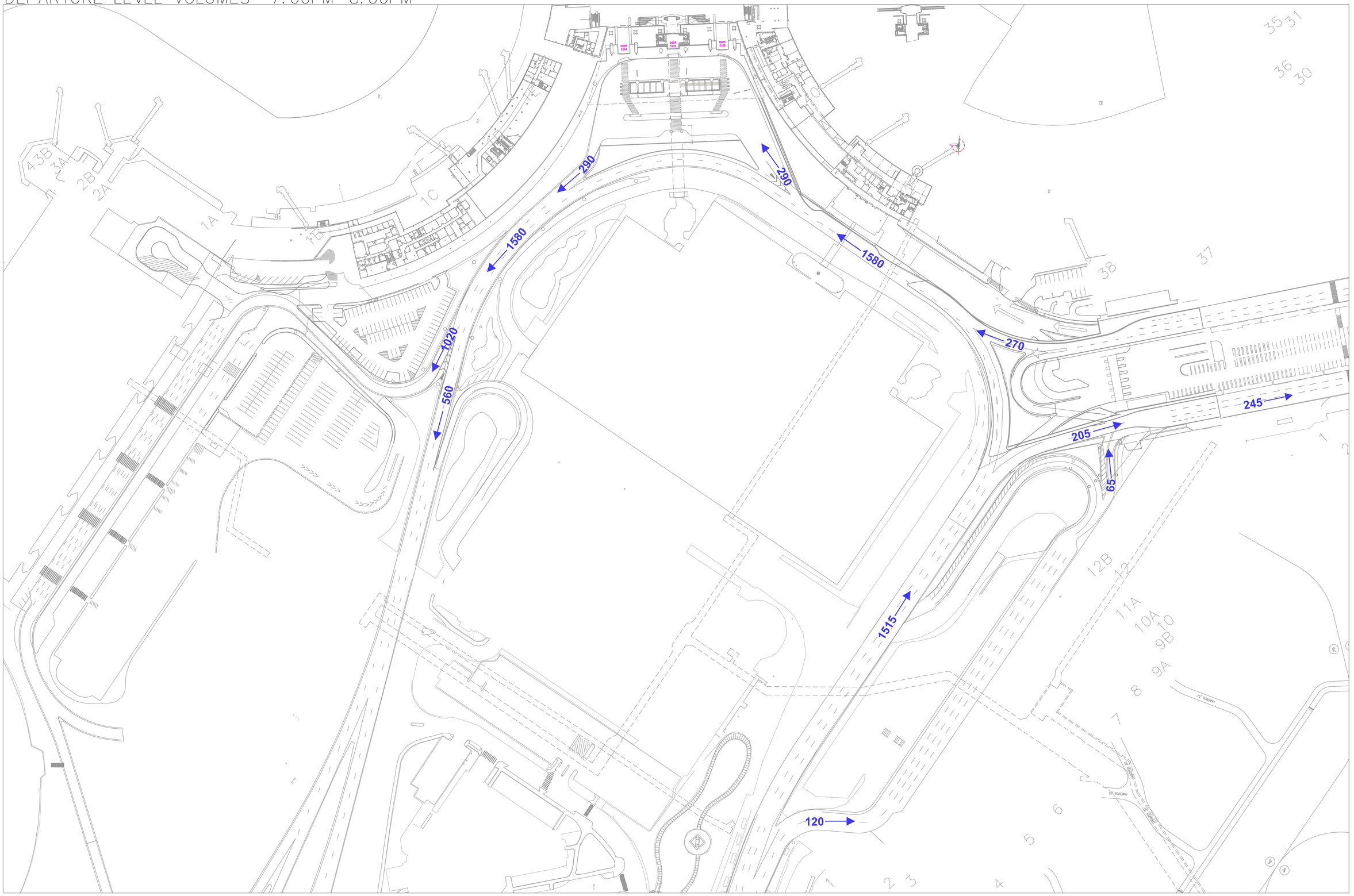
DEPARTURE LEVEL VOLUMES 5:00PM–6:00PM



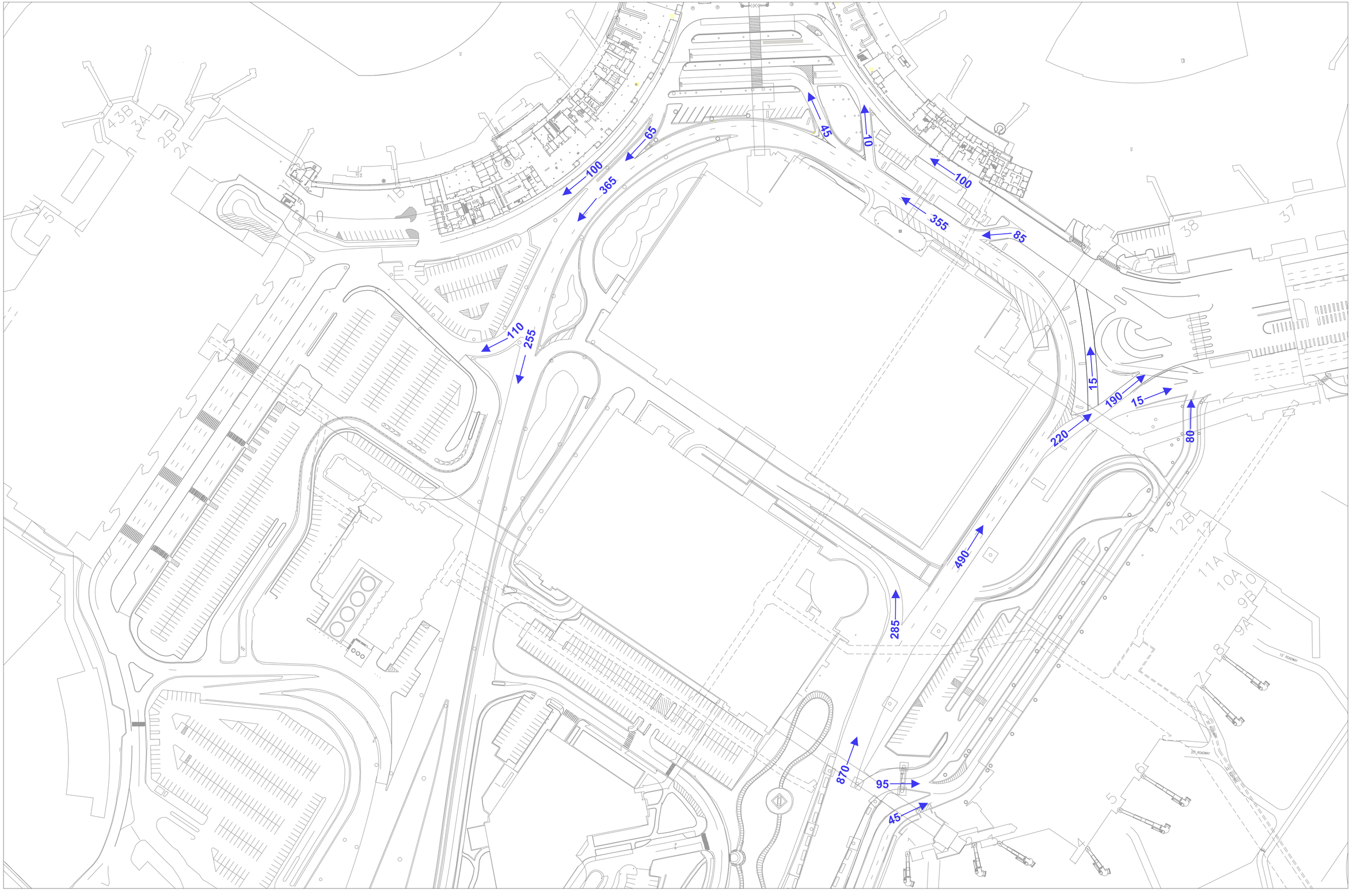
DEPARTURE LEVEL VOLUMES 6:00PM–7:00PM



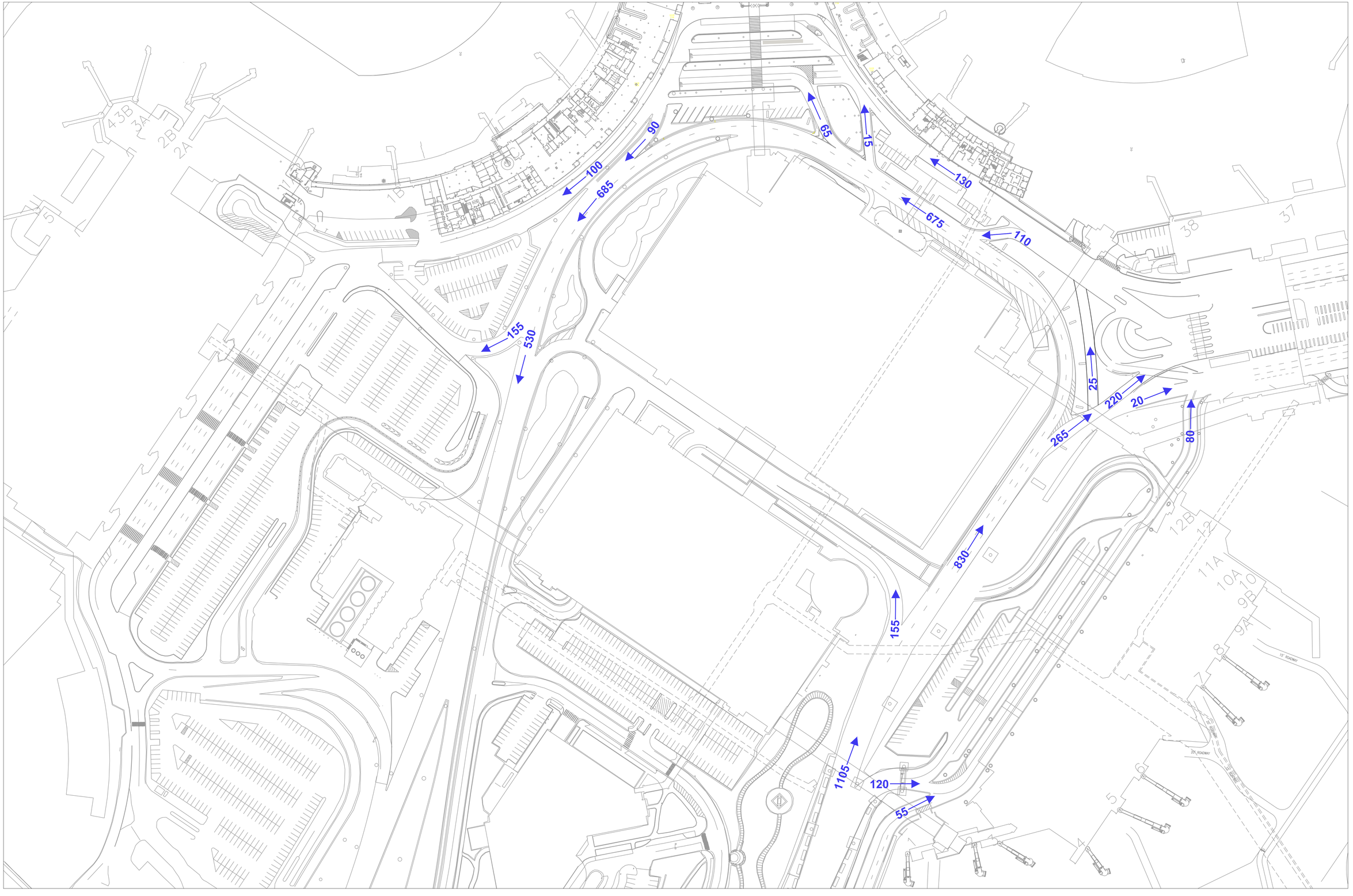
DEPARTURE LEVEL VOLUMES 7:00PM–8:00PM



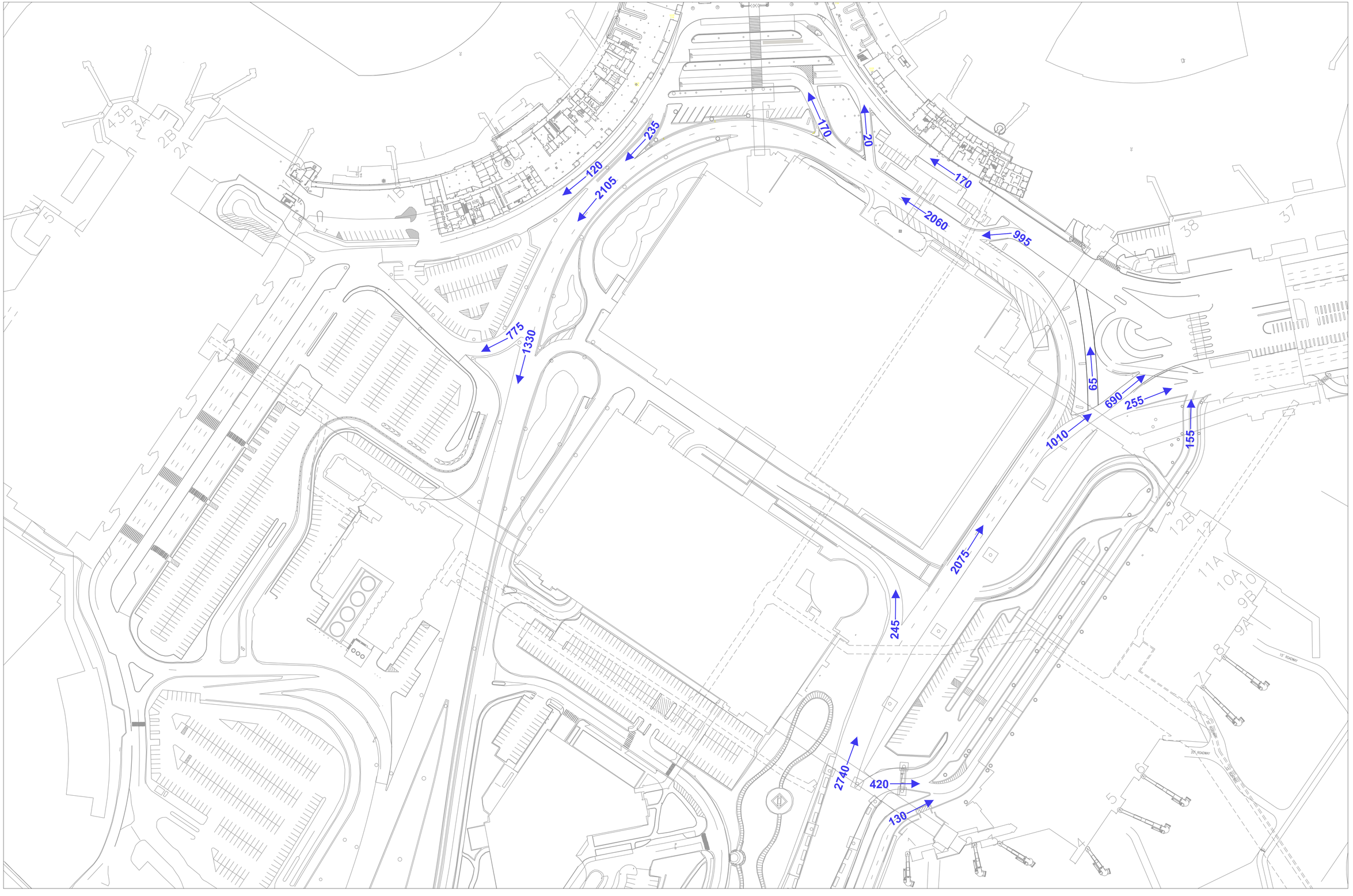
ARRIVAL LEVEL VOLUMES 5:00AM–6:00AM



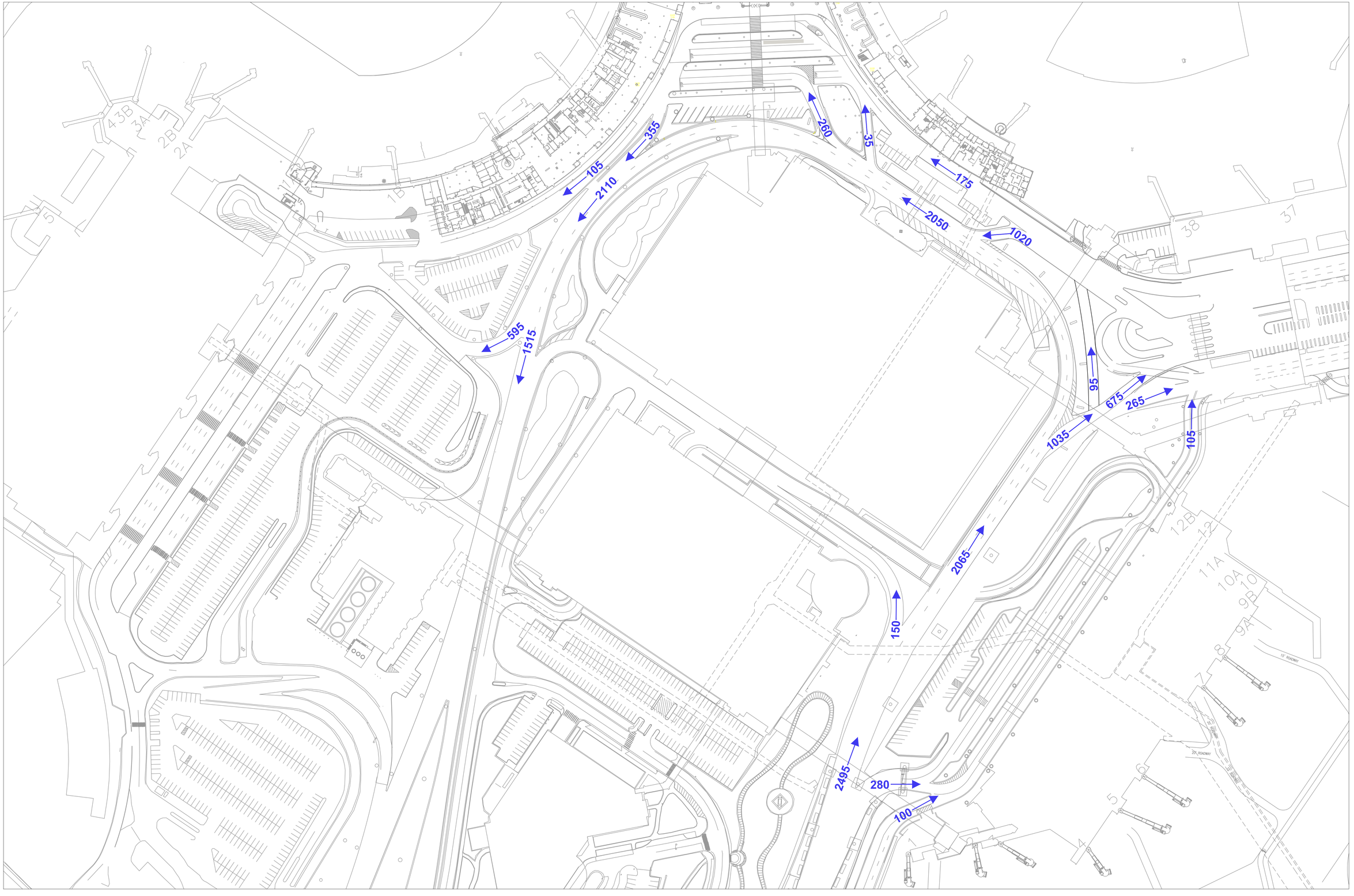
ARRIVAL LEVEL VOLUMES 6:00AM–7:00AM



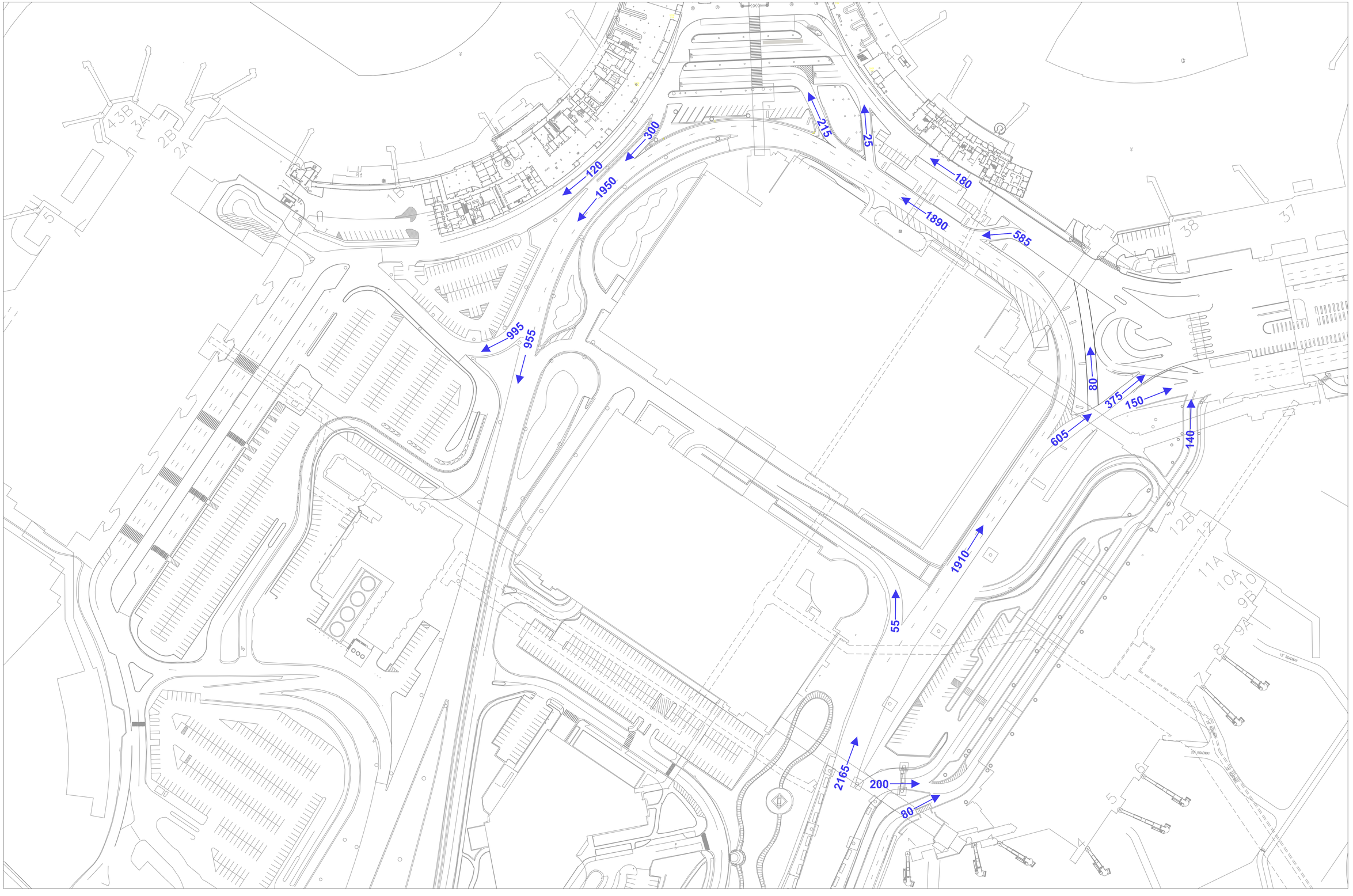
ARRIVAL LEVEL VOLUMES 5:00PM–6:00PM



ARRIVAL LEVEL VOLUMES 6:00PM–7:00PM



ARRIVAL LEVEL VOLUMES 7:00PM–8:00PM



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Departures Curb1
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	AllBus	CW	AllBus
Type	active	xwalk	active
Curbside frontage (feet)	155	20	155
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Drop-Off	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	15	15	15
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	22	22	22
RCBL	10	10	10
Limo	-	-	-
Shared Van	15	15	15
Silver Line	-	-	-
Logan Express	10	10	10
Scheduled Bus Service	2	2	2
Charter Bus	-	-	-
Volume of vehicles using curbside (vph)			
Private Vehicle Drop-Off	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	8	-	7
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	11	-	11
RCBL	5	-	5
Limo	-	-	-
Shared Van	7	-	8
Silver Line	-	-	-
Logan Express	5	-	5
Scheduled Bus Service	1	-	1
Charter Bus	-	-	-

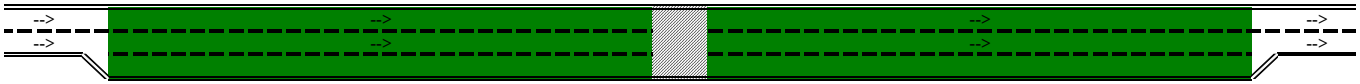
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Departures Curb1
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	AllBus	CW	AllBus
Curb length (feet)	155	20	155
Zone type	active	xwalk	active
Roadway volume (vph)	74	74	74
Roadway capacity (vph)	2,343	2,657	2,343
Roadway V/C ratio	0.032	0.028	0.032
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	2.0	N/A	2.0
Curb capacity per lane (vehicles)	4.0	N/A	4.0
Curb utilization ratio	0.500	N/A	0.500
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	AllBus	CW	AllBus
Type of zone	active	xwalk	active
Curbside length (feet)	155	20	155
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	74	74	74
Curbside demand (vph)	37	-	37
Average dwell time (minutes)	1.09	-	1.09
Average vehicle length (feet)	43.78	-	43.51
Average vehicle arrival rate (vph)	37.00	-	37.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,468	2,797	2,468
Adjusted through lane roadway capacity	2,343	2,657	2,343
Estimated roadway V/C ratio	0.032	0.028	0.032
Curb capacity per lane (vehicles)	4.00	-	4.00
Curb utilization ratio	0.500	-	0.500
% occupancy in lane 1	0.490	-	0.490
% occupancy in lane 2	-	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	1.96	-	1.96
# of double-parked cars	-	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING - Departures Curb1
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	7
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	PDO	CW	PDO	CW	PDO	CW	PDO
Type	active	xwalk	active	xwalk	active	xwalk	active
Curbside frontage (feet)	60	12	60	21	60	12	60
Number of lanes	3	3	3	3	3	3	3
Number of approach lanes	2	2	2	2	2	2	2
Volume of vehicles using roadway (vph)							
Private Vehicle Drop-Off	395	395	395	395	395	395	395
Taxicabs	41	41	41	41	41	41	41
TNC	200	200	200	200	200	200	200
MPA Economy Parking	-	-	-	-	-	-	-
MPA Employee	-	-	-	-	-	-	-
MPA Water Taxi	-	-	-	-	-	-	-
MPA Interterminal	-	-	-	-	-	-	-
Courtesy Shuttle	-	-	-	-	-	-	-
RCBL	-	-	-	-	-	-	-
Limo	-	-	-	-	-	-	-
Shared Van	-	-	-	-	-	-	-
Silver Line	-	-	-	-	-	-	-
Logan Express	-	-	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	-	-
Charter Bus	-	-	-	-	-	-	-
Volume of vehicles using curbside (vph)							
Private Vehicle Drop-Off	99	-	99	-	99	-	98
Taxicabs	10	-	10	-	10	-	11
TNC	50	-	50	-	50	-	50
MPA Economy Parking	-	-	-	-	-	-	-
MPA Employee	-	-	-	-	-	-	-
MPA Water Taxi	-	-	-	-	-	-	-
MPA Interterminal	-	-	-	-	-	-	-
Courtesy Shuttle	-	-	-	-	-	-	-
RCBL	-	-	-	-	-	-	-
Limo	-	-	-	-	-	-	-
Shared Van	-	-	-	-	-	-	-
Silver Line	-	-	-	-	-	-	-
Logan Express	-	-	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	-	-
Charter Bus	-	-	-	-	-	-	-

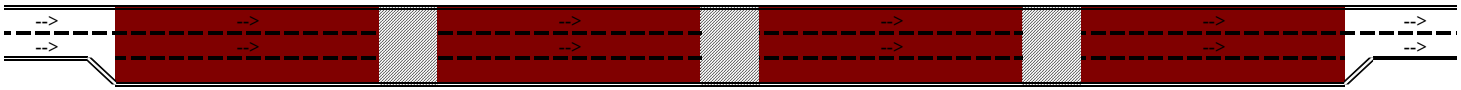
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING - Departures Curb1
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	7



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name/description	PDO	CW	PDO	CW	PDO	CW	PDO
Curb length (feet)	60	12	60	21	60	12	60
Zone type	active	xwalk	active	xwalk	active	xwalk	active
Roadway volume (vph)	636	636	636	636	636	636	636
Roadway capacity (vph)	0	2,657	0	2,657	0	2,657	0
Roadway V/C ratio	1000000.000	0.239	1000000.000	0.239	1000000.000	0.239	1000000.000
Roadway LOS	F	A	F	A	F	A	F
Curb demand (# in sys 95% of time)	5.0	N/A	5.0	N/A	5.0	N/A	5.0
Curb capacity per lane (vehicles)	2.0	N/A	2.0	N/A	2.0	N/A	2.0
Curb utilization ratio	2.500	N/A	2.500	N/A	2.500	N/A	2.500
Curb LOS	F	N/A	F	N/A	F	N/A	F

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	PDO	CW	PDO	CW	PDO	CW	PDO
Type of zone	active	xwalk	active	xwalk	active	xwalk	active
Curbside length (feet)	60	12	60	21	60	12	60
Number of lanes	3	3	3	3	3	3	3
Number of approach lanes	2	2	2	2	2	2	2
Roadway volume (vph)	636	636	636	636	636	636	636
Curbside demand (vph)	159	-	159	-	159	-	159
Average dwell time (minutes)	0.97	-	0.97	-	0.97	-	0.97
Average vehicle length (feet)	25.00	-	25.00	-	25.00	-	25.00
Average vehicle arrival rate (vph)	159.00	-	159.00	-	159.00	-	159.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	-	2,797	-	2,797	-	2,797	-
Adjusted through lane roadway capacity	-	2,657	-	2,657	-	2,657	-
Estimated roadway V/C ratio	1,000,000.000	0.239	##########	0.239	##########	0.239	##########
Curb capacity per lane (vehicles)	2.00	-	2.00	-	2.00	-	2.00
Curb utilization ratio	2.500	-	2.500	-	2.500	-	2.500
% occupancy in lane 1	1.000	-	1.000	-	1.000	-	1.000
% occupancy in lane 2	1.000	-	1.000	-	1.000	-	1.000
% occupancy in lane 3	0.50	-	0.50	-	0.50	-	0.50
# of cars in curbside lane	2.00	-	2.00	-	2.00	-	2.00
# of double-parked cars	2.00	-	2.00	-	2.00	-	2.00
# of triple-parked cars	1.000	-	1.000	-	1.000	-	1.000
Curbside LOS	F		F		F		F
Roadway LOS	F	A	F	A	F	A	F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Departures Curb1
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	7
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	PDO	CW	PDO	CW	PDO	CW	PDO
Type	active	xwalk	active	xwalk	active	xwalk	active
Curbside frontage (feet)	60	12	60	21	60	12	60
Number of lanes	3	3	3	3	3	3	3
Number of approach lanes	2	2	2	2	2	2	2
Volume of vehicles using roadway (vph)							
Private Vehicle Drop-Off	365	365	365	365	365	365	365
Taxicabs	40	40	40	40	40	40	40
TNC	343	343	343	343	343	343	343
MPA Economy Parking	-	-	-	-	-	-	-
MPA Employee	-	-	-	-	-	-	-
MPA Water Taxi	-	-	-	-	-	-	-
MPA Interterminal	-	-	-	-	-	-	-
Courtesy Shuttle	-	-	-	-	-	-	-
RCBL	-	-	-	-	-	-	-
Limo	-	-	-	-	-	-	-
Shared Van	-	-	-	-	-	-	-
Silver Line	-	-	-	-	-	-	-
Logan Express	-	-	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	-	-
Charter Bus	-	-	-	-	-	-	-
Volume of vehicles using curbside (vph)							
Private Vehicle Drop-Off	91	-	91	-	91	-	90
Taxicabs	10	-	10	-	10	-	10
TNC	86	-	86	-	86	-	85
MPA Economy Parking	-	-	-	-	-	-	-
MPA Employee	-	-	-	-	-	-	-
MPA Water Taxi	-	-	-	-	-	-	-
MPA Interterminal	-	-	-	-	-	-	-
Courtesy Shuttle	-	-	-	-	-	-	-
RCBL	-	-	-	-	-	-	-
Limo	-	-	-	-	-	-	-
Shared Van	-	-	-	-	-	-	-
Silver Line	-	-	-	-	-	-	-
Logan Express	-	-	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	-	-
Charter Bus	-	-	-	-	-	-	-

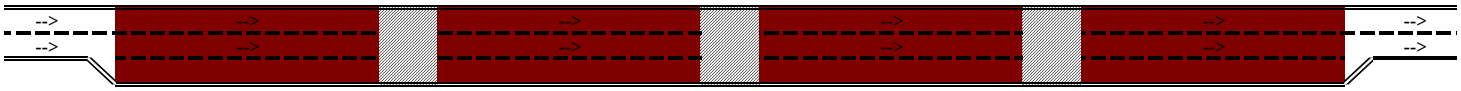
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Departures Curb1
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	7



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name/description	PDO	CW	PDO	CW	PDO	CW	PDO
Curb length (feet)	60	12	60	21	60	12	60
Zone type	active	xwalk	active	xwalk	active	xwalk	active
Roadway volume (vph)	748	748	748	748	748	748	748
Roadway capacity (vph)	0	2,657	0	2,657	0	2,657	0
Roadway V/C ratio	1000000.000	0.282	1000000.000	0.282	1000000.000	0.282	1000000.000
Roadway LOS	F	B	F	B	F	B	F
Curb demand (# in sys 95% of time)	6.0	N/A	6.0	N/A	6.0	N/A	6.0
Curb capacity per lane (vehicles)	2.0	N/A	2.0	N/A	2.0	N/A	2.0
Curb utilization ratio	3.000	N/A	3.000	N/A	3.000	N/A	3.000
Curb LOS	F	N/A	F	N/A	F	N/A	F

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	PDO	CW	PDO	CW	PDO	CW	PDO
Type of zone	active	xwalk	active	xwalk	active	xwalk	active
Curbside length (feet)	60	12	60	21	60	12	60
Number of lanes	3	3	3	3	3	3	3
Number of approach lanes	2	2	2	2	2	2	2
Roadway volume (vph)	748	748	748	748	748	748	748
Curbside demand (vph)	187	-	187	-	187	-	185
Average dwell time (minutes)	0.89	-	0.89	-	0.89	-	0.89
Average vehicle length (feet)	25.00	-	25.00	-	25.00	-	25.00
Average vehicle arrival rate (vph)	187.00	-	187.00	-	187.00	-	185.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	-	2,797	-	2,797	-	2,797	-
Adjusted through lane roadway capacity	-	2,657	-	2,657	-	2,657	-
Estimated roadway V/C ratio	1,000,000.000	0.282	##########	0.282	##########	0.282	##########
Curb capacity per lane (vehicles)	2.00	-	2.00	-	2.00	-	2.00
Curb utilization ratio	3.000	-	3.000	-	3.000	-	3.000
% occupancy in lane 1	1.000	-	1.000	-	1.000	-	1.000
% occupancy in lane 2	1.000	-	1.000	-	1.000	-	1.000
% occupancy in lane 3	1.00	-	1.00	-	1.00	-	1.00
# of cars in curbside lane	2.00	-	2.00	-	2.00	-	2.00
# of double-parked cars	2.00	-	2.00	-	2.00	-	2.00
# of triple-parked cars	2.000	-	2.000	-	2.000	-	2.000
Curbside LOS	F		F		F		F
Roadway LOS	F	B	F	B	F	B	F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Departures Curb2
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	)O/Taxi/Limo	CW	)O/Taxi/Limo
Type	active	xwalk	active
Curbside frontage (feet)	105	20	105
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Drop-Off	87	87	87
Taxicabs	32	32	32
TNC	82	82	82
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	11	11	11
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-
Volume of vehicles using curbside (vph)			
Private Vehicle Drop-Off	44	-	43
Taxicabs	16	-	16
TNC	41	-	41
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	5	-	6
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-

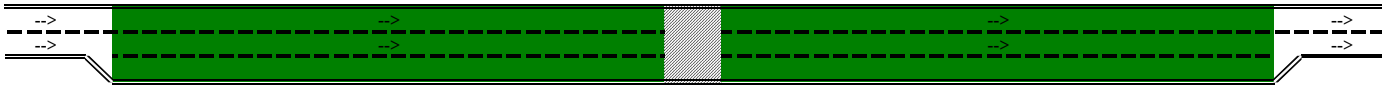
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Departures Curb2
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	PDO/Taxi/Limo	CW	PDO/Taxi/Limo
Curb length (feet)	105	20	105
Zone type	active	xwalk	active
Roadway volume (vph)	212	212	212
Roadway capacity (vph)	1,976	2,657	1,976
Roadway V/C ratio	0.107	0.080	0.107
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	4.0	N/A	4.0
Curb capacity per lane (vehicles)	4.0	N/A	4.0
Curb utilization ratio	1.000	N/A	1.000
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	PDO/Taxi/Limo	CW PDO/Taxi/Limo	
Type of zone	active	xwalk	active
Curbside length (feet)	105	20	105
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	212	212	212
Curbside demand (vph)	106	-	106
Average dwell time (minutes)	0.90	-	0.90
Average vehicle length (feet)	25.24	-	25.28
Average vehicle arrival rate (vph)	106.00	-	106.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	2,797	2,082
Adjusted through lane roadway capacity	1,976	2,657	1,976
Estimated roadway V/C ratio	0.107	0.080	0.107
Curb capacity per lane (vehicles)	4.00	-	4.00
Curb utilization ratio	1.000	-	1.000
% occupancy in lane 1	0.895	-	0.895
% occupancy in lane 2	0.095	-	0.095
% occupancy in lane 3	-	-	-
# of cars in curbside lane	3.58	-	3.58
# of double-parked cars	0.38	-	0.38
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING - Departures Curb2
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	5
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name	CW	RCBL	CW	AllBus	CW
Type	xwalk	active	xwalk	active	xwalk
Curbside frontage (feet)	12	80	21	80	12
Number of lanes	3	3	3	3	3
Number of approach lanes	2	2	2	2	2
Volume of vehicles using roadway (vph)					
Private Vehicle Drop-Off	-	-	-	-	-
Taxicabs	-	-	-	-	-
TNC	-	-	-	-	-
MPA Economy Parking	-	-	-	-	-
MPA Employee	15	15	15	15	15
MPA Water Taxi	-	-	-	-	-
MPA Interterminal	-	-	-	-	-
Courtesy Shuttle	22	22	22	22	22
RCBL	10	10	10	10	10
Limo	-	-	-	-	-
Shared Van	15	15	15	15	15
Silver Line	-	-	-	-	-
Logan Express	10	10	10	10	10
Scheduled Bus Service	2	2	2	2	2
Charter Bus	-	-	-	-	-
Volume of vehicles using curbside (vph)					
Private Vehicle Drop-Off	-	-	-	-	-
Taxicabs	-	-	-	-	-
TNC	-	-	-	-	-
MPA Economy Parking	-	-	-	-	-
MPA Employee	-	-	-	15	-
MPA Water Taxi	-	-	-	-	-
MPA Interterminal	-	-	-	-	-
Courtesy Shuttle	-	-	-	22	-
RCBL	-	10	-	-	-
Limo	-	-	-	-	-
Shared Van	-	-	-	15	-
Silver Line	-	-	-	-	-
Logan Express	-	-	-	10	-
Scheduled Bus Service	-	-	-	2	-
Charter Bus	-	-	-	-	-

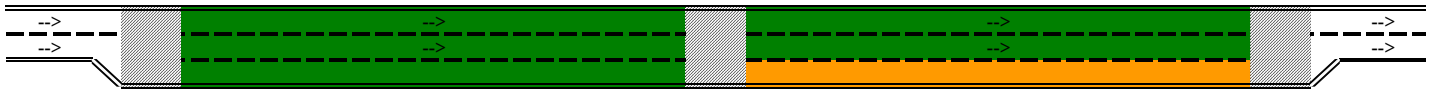
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING - Departures Curb2
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	5



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name/description	CW	RCBL	CW	AllBus	CW
Curb length (feet)	12	80	21	80	12
Zone type	xwalk	active	xwalk	active	xwalk
Roadway volume (vph)	74	74	74	74	74
Roadway capacity (vph)	2,657	1,976	2,657	1,139	2,657
Roadway V/C ratio	0.028	0.037	0.028	0.065	0.028
Roadway LOS	A	A	A	A	A
Curb demand (# in sys 95% of time)	N/A	1.0	N/A	3.0	N/A
Curb capacity per lane (vehicles)	N/A	1.0	N/A	2.0	N/A
Curb utilization ratio	N/A	1.000	N/A	1.500	N/A
Curb LOS	N/A	A	N/A	D	N/A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name	CW	RCBL	CW	AllBus	CW
Type of zone	xwalk	active	xwalk	active	xwalk
Curbside length (feet)	12	80	21	80	12
Number of lanes	3	3	3	3	3
Number of approach lanes	2	2	2	2	2
Roadway volume (vph)	74	74	74	74	74
Curbside demand (vph)	-	10	-	64	-
Average dwell time (minutes)	-	0.90	-	1.12	-
Average vehicle length (feet)	-	70.00	-	39.53	-
Average vehicle arrival rate (vph)	-	10.00	-	64.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,797	2,082	2,797	1,200	2,797
Adjusted through lane roadway capacity	2,657	1,976	2,657	1,139	2,657
Estimated roadway V/C ratio	0.028	0.037	0.028	0.065	0.028
Curb capacity per lane (vehicles)	-	1.00	-	2.00	-
Curb utilization ratio	-	1.000	-	1.500	-
% occupancy in lane 1	-	0.895	-	1.000	-
% occupancy in lane 2	-	0.095	-	0.490	-
% occupancy in lane 3	-	-	-	-	-
# of cars in curbside lane	-	0.90	-	2.00	-
# of double-parked cars	-	0.10	-	0.98	-
# of triple-parked cars	-	-	-	-	-
Curbside LOS		A		D	
Roadway LOS	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Departures Curb2
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	5
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name	CW	RCBL	CW	AllBus	CW
Type	xwalk	active	xwalk	active	xwalk
Curbside frontage (feet)	12	80	21	80	12
Number of lanes	3	3	3	3	3
Number of approach lanes	2	2	2	2	2
Volume of vehicles using roadway (vph)					
Private Vehicle Drop-Off	-	-	-	-	-
Taxicabs	-	-	-	-	-
TNC	-	-	-	-	-
MPA Economy Parking	-	-	-	-	-
MPA Employee	15	15	15	15	15
MPA Water Taxi	-	-	-	-	-
MPA Interterminal	-	-	-	-	-
Courtesy Shuttle	22	22	22	22	22
RCBL	10	10	10	10	10
Limo	-	-	-	-	-
Shared Van	15	15	15	15	15
Silver Line	-	-	-	-	-
Logan Express	10	10	10	10	10
Scheduled Bus Service	2	2	2	2	2
Charter Bus	-	-	-	-	-
Volume of vehicles using curbside (vph)					
Private Vehicle Drop-Off	-	-	-	-	-
Taxicabs	-	-	-	-	-
TNC	-	-	-	-	-
MPA Economy Parking	-	-	-	-	-
MPA Employee	-	-	-	15	-
MPA Water Taxi	-	-	-	-	-
MPA Interterminal	-	-	-	-	-
Courtesy Shuttle	-	-	-	22	-
RCBL	-	10	-	-	-
Limo	-	-	-	-	-
Shared Van	-	-	-	15	-
Silver Line	-	-	-	-	-
Logan Express	-	-	-	10	-
Scheduled Bus Service	-	-	-	2	-
Charter Bus	-	-	-	-	-

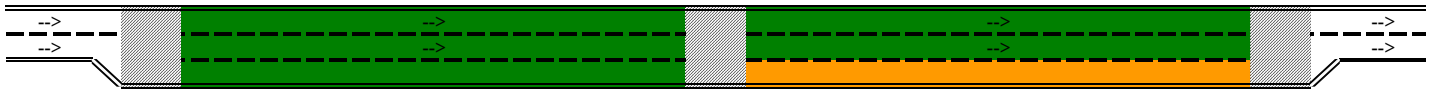
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Departures Curb2
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	5



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name/description	CW	RCBL	CW	AllBus	CW
Curb length (feet)	12	80	21	80	12
Zone type	xwalk	active	xwalk	active	xwalk
Roadway volume (vph)	74	74	74	74	74
Roadway capacity (vph)	2,657	1,976	2,657	1,139	2,657
Roadway V/C ratio	0.028	0.037	0.028	0.065	0.028
Roadway LOS	A	A	A	A	A
Curb demand (# in sys 95% of time)	N/A	1.0	N/A	3.0	N/A
Curb capacity per lane (vehicles)	N/A	1.0	N/A	2.0	N/A
Curb utilization ratio	N/A	1.000	N/A	1.500	N/A
Curb LOS	N/A	A	N/A	D	N/A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name	CW	RCBL	CW	AllBus	CW
Type of zone	xwalk	active	xwalk	active	xwalk
Curbside length (feet)	12	80	21	80	12
Number of lanes	3	3	3	3	3
Number of approach lanes	2	2	2	2	2
Roadway volume (vph)	74	74	74	74	74
Curbside demand (vph)	-	10	-	64	-
Average dwell time (minutes)	-	0.90	-	1.12	-
Average vehicle length (feet)	-	70.00	-	39.53	-
Average vehicle arrival rate (vph)	-	10.00	-	64.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,797	2,082	2,797	1,200	2,797
Adjusted through lane roadway capacity	2,657	1,976	2,657	1,139	2,657
Estimated roadway V/C ratio	0.028	0.037	0.028	0.065	0.028
Curb capacity per lane (vehicles)	-	1.00	-	2.00	-
Curb utilization ratio	-	1.000	-	1.500	-
% occupancy in lane 1	-	0.895	-	1.000	-
% occupancy in lane 2	-	0.095	-	0.490	-
% occupancy in lane 3	-	-	-	-	-
# of cars in curbside lane	-	0.90	-	2.00	-
# of double-parked cars	-	0.10	-	0.98	-
# of triple-parked cars	-	-	-	-	-
Curbside LOS		A		D	
Roadway LOS	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Departures Curb3
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	)O/Taxi/Limo	CW	)O/Taxi/Limo
Type	active	xwalk	active
Curbside frontage (feet)	125	20	125
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Drop-Off	115	115	115
Taxicabs	42	42	42
TNC	108	108	108
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	14	14	14
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-
Volume of vehicles using curbside (vph)			
Private Vehicle Drop-Off	58	-	57
Taxicabs	21	-	21
TNC	54	-	54
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	7	-	7
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-

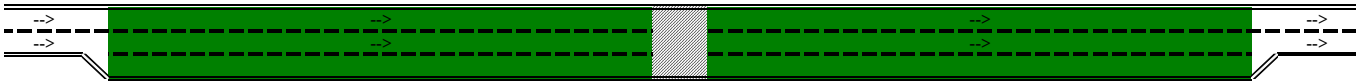
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Departures Curb3
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	PDO/Taxi/Limo	CW	PDO/Taxi/Limo
Curb length (feet)	125	20	125
Zone type	active	xwalk	active
Roadway volume (vph)	279	279	279
Roadway capacity (vph)	1,976	2,657	1,976
Roadway V/C ratio	0.141	0.105	0.141
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	5.0	N/A	5.0
Curb capacity per lane (vehicles)	5.0	N/A	5.0
Curb utilization ratio	1.000	N/A	1.000
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

A	
B	
C	
D	
E	
F	

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	PDO/Taxi/Limo	CW ᵖDO/Taxi/Limo	
Type of zone	active	xwalk	active
Curbside length (feet)	125	20	125
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	279	279	279
Curbside demand (vph)	140	-	139
Average dwell time (minutes)	0.90	-	0.90
Average vehicle length (feet)	25.25	-	25.25
Average vehicle arrival rate (vph)	140.00	-	139.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	2,797	2,082
Adjusted through lane roadway capacity	1,976	2,657	1,976
Estimated roadway V/C ratio	0.141	0.105	0.141
Curb capacity per lane (vehicles)	5.00	-	5.00
Curb utilization ratio	1.000	-	1.000
% occupancy in lane 1	0.895	-	0.895
% occupancy in lane 2	0.095	-	0.095
% occupancy in lane 3	-	-	-
# of cars in curbside lane	4.48	-	4.48
# of double-parked cars	0.48	-	0.48
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING - Departures Curb3
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	Limo/taxi	CW	Limo/taxi
Type	active	xwalk	active
Curbside frontage (feet)	85	20	85
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Drop-Off	-	-	-
Taxicabs	95	95	95
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	100	100	100
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-
Volume of vehicles using curbside (vph)			
Private Vehicle Drop-Off	-	-	-
Taxicabs	48	-	47
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	50	-	50
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-

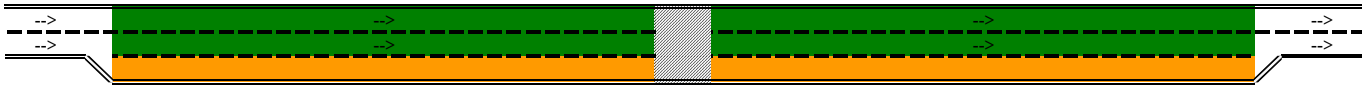
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING - Departures Curb3
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	Limo/taxi	CW	Limo/taxi
Curb length (feet)	85	20	85
Zone type	active	xwalk	active
Roadway volume (vph)	195	195	195
Roadway capacity (vph)	1,446	2,657	1,446
Roadway V/C ratio	0.135	0.073	0.135
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	4.0	N/A	4.0
Curb capacity per lane (vehicles)	3.0	N/A	3.0
Curb utilization ratio	1.333	N/A	1.333
Curb LOS	D	N/A	D

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	Limo/taxi	CW	Limo/taxi
Type of zone	active	xwalk	active
Curbside length (feet)	85	20	85
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	195	195	195
Curbside demand (vph)	98	-	97
Average dwell time (minutes)	0.93	-	0.93
Average vehicle length (feet)	27.55	-	27.58
Average vehicle arrival rate (vph)	98.00	-	97.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	1,523	2,797	1,523
Adjusted through lane roadway capacity	1,446	2,657	1,446
Estimated roadway V/C ratio	0.135	0.073	0.135
Curb capacity per lane (vehicles)	3.00	-	3.00
Curb utilization ratio	1.333	-	1.333
% occupancy in lane 1	1.000	-	1.000
% occupancy in lane 2	0.330	-	0.330
% occupancy in lane 3	-	-	-
# of cars in curbside lane	3.00	-	3.00
# of double-parked cars	0.99	-	0.99
# of triple-parked cars	-	-	-
Curbside LOS	D		D
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Departures Curb3
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Drop-Off	25.0	1.2
Taxicabs	25.0	1.0
TNC	25.0	0.6
MPA Economy Parking	40.0	0.9
MPA Employee	40.0	0.9
MPA Water Taxi	40.0	0.9
MPA Interterminal	40.0	0.9
Courtesy Shuttle	40.0	0.9
RCBL	70.0	0.9
Limo	30.0	0.9
Shared Van	30.0	0.9
Silver Line	70	1
Logan Express	50	2
Scheduled Bus Service	50	2
Charter Bus	50	2

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	Limo/taxi	CW	Limo/taxi
Type	active	xwalk	active
Curbside frontage (feet)	85	20	85
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Drop-Off	-	-	-
Taxicabs	94	94	94
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	46	46	46
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-
Volume of vehicles using curbside (vph)			
Private Vehicle Drop-Off	-	-	-
Taxicabs	47	-	47
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	23	-	23
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus Service	-	-	-
Charter Bus	-	-	-

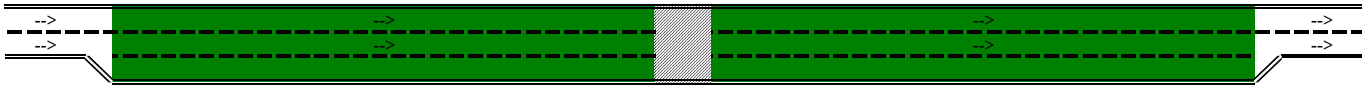
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Departures Curb3
Level / type of roadway	Departures
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	Limo/taxi	CW	Limo/taxi
Curb length (feet)	85	20	85
Zone type	active	xwalk	active
Roadway volume (vph)	140	140	140
Roadway capacity (vph)	1,976	2,657	1,976
Roadway V/C ratio	0.071	0.053	0.071
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	3.0	N/A	3.0
Curb capacity per lane (vehicles)	3.0	N/A	3.0
Curb utilization ratio	1.000	N/A	1.000
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	Limo/taxi	CW	Limo/taxi
Type of zone	active	xwalk	active
Curbside length (feet)	85	20	85
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	140	140	140
Curbside demand (vph)	70	-	70
Average dwell time (minutes)	0.95	-	0.95
Average vehicle length (feet)	26.64	-	26.64
Average vehicle arrival rate (vph)	70.00	-	70.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	2,797	2,082
Adjusted through lane roadway capacity	1,976	2,657	1,976
Estimated roadway V/C ratio	0.071	0.053	0.071
Curb capacity per lane (vehicles)	3.00	-	3.00
Curb utilization ratio	1.000	-	1.000
% occupancy in lane 1	0.895	-	0.895
% occupancy in lane 2	0.095	-	0.095
% occupancy in lane 3	-	-	-
# of cars in curbside lane	2.69	-	2.69
# of double-parked cars	0.29	-	0.29
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb1
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	Taxi	CW	MPA
Type	active	xwalk	active
Curbside frontage (feet)	230	20	100
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	95	95	95
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	16	16	16
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	-	-	-
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-
Volume of vehicles using curbside (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	95	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	16
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	-	-	-
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

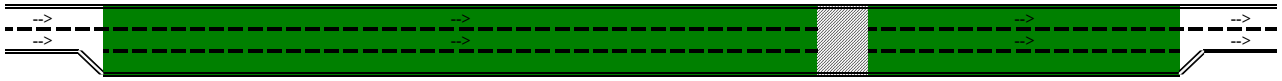
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb1
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	Taxi	CW	MPA
Curb length (feet)	230	20	100
Zone type	active	xwalk	active
Roadway volume (vph)	111	111	111
Roadway capacity (vph)	2,395	2,657	2,395
Roadway V/C ratio	0.046	0.042	0.046
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	3.0	N/A	1.0
Curb capacity per lane (vehicles)	9.0	N/A	3.0
Curb utilization ratio	0.333	N/A	0.333
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	Taxi	CW	MPA
Type of zone	active	xwalk	active
Curbside length (feet)	230	20	100
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	111	111	111
Curbside demand (vph)	95	-	16
Average dwell time (minutes)	0.60	-	0.68
Average vehicle length (feet)	25.00	-	40.00
Average vehicle arrival rate (vph)	95.00	-	16.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,522	2,797	2,522
Adjusted through lane roadway capacity	2,395	2,657	2,395
Estimated roadway V/C ratio	0.046	0.042	0.046
Curb capacity per lane (vehicles)	9.00	-	3.00
Curb utilization ratio	0.333	-	0.333
% occupancy in lane 1	0.330	-	0.330
% occupancy in lane 2	-	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	2.97	-	0.99
# of double-parked cars	-	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb1
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	Taxi	CW	MPA
Type	active	xwalk	active
Curbside frontage (feet)	230	20	100
Number of lanes	3	3	3
Number of approach lanes	2	2	2

Volume of vehicles using roadway (vph)

Private Vehicle Pick-Up	-	-	-
Taxicabs	55	55	55
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	16	16	16
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	-	-	-
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

Volume of vehicles using curbside (vph)

Private Vehicle Pick-Up	-	-	-
Taxicabs	55	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	16
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	-	-	-
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

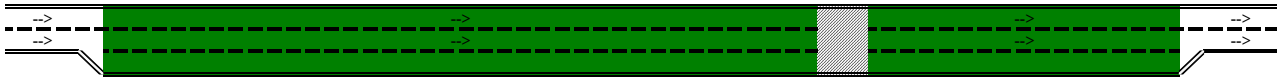
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb1
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	Taxi	CW	MPA
Curb length (feet)	230	20	100
Zone type	active	xwalk	active
Roadway volume (vph)	71	71	71
Roadway capacity (vph)	2,442	2,657	2,395
Roadway V/C ratio	0.029	0.027	0.030
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	2.0	N/A	1.0
Curb capacity per lane (vehicles)	9.0	N/A	3.0
Curb utilization ratio	0.222	N/A	0.333
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	Taxi	CW	MPA
Type of zone	active	xwalk	active
Curbside length (feet)	230	20	100
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	71	71	71
Curbside demand (vph)	55	-	16
Average dwell time (minutes)	0.60	-	0.68
Average vehicle length (feet)	25.00	-	40.00
Average vehicle arrival rate (vph)	55.00	-	16.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,572	2,797	2,522
Adjusted through lane roadway capacity	2,442	2,657	2,395
Estimated roadway V/C ratio	0.029	0.027	0.030
Curb capacity per lane (vehicles)	9.00	-	3.00
Curb utilization ratio	0.222	-	0.333
% occupancy in lane 1	0.220	-	0.330
% occupancy in lane 2	-	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	1.98	-	0.99
# of double-parked cars	-	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb1
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	Taxi	CW	MPA
Type	active	xwalk	active
Curbside frontage (feet)	230	20	100
Number of lanes	3	3	3
Number of approach lanes	2	2	2

Volume of vehicles using roadway (vph)

Private Vehicle Pick-Up	-	-	-
Taxicabs	95	95	95
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	16	16	16
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	-	-	-
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

Volume of vehicles using curbside (vph)

Private Vehicle Pick-Up	-	-	-
Taxicabs	95	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	16
Courtesy Shuttle	-	-	-
RCBL	-	-	-
Limo	-	-	-
Shared Van	-	-	-
Silver Line	-	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

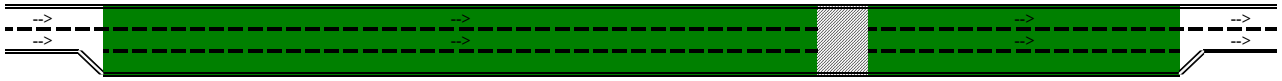
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb1
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	Taxi	CW	MPA
Curb length (feet)	230	20	100
Zone type	active	xwalk	active
Roadway volume (vph)	111	111	111
Roadway capacity (vph)	2,395	2,657	2,395
Roadway V/C ratio	0.046	0.042	0.046
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	3.0	N/A	1.0
Curb capacity per lane (vehicles)	9.0	N/A	3.0
Curb utilization ratio	0.333	N/A	0.333
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	Taxi	CW	MPA
Type of zone	active	xwalk	active
Curbside length (feet)	230	20	100
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	111	111	111
Curbside demand (vph)	95	-	16
Average dwell time (minutes)	0.60	-	0.68
Average vehicle length (feet)	25.00	-	40.00
Average vehicle arrival rate (vph)	95.00	-	16.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,522	2,797	2,522
Adjusted through lane roadway capacity	2,395	2,657	2,395
Estimated roadway V/C ratio	0.046	0.042	0.046
Curb capacity per lane (vehicles)	9.00	-	3.00
Curb utilization ratio	0.333	-	0.333
% occupancy in lane 1	0.330	-	0.330
% occupancy in lane 2	-	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	2.97	-	0.99
# of double-parked cars	-	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb2
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	SL	CW	RCBL
Type	active	xwalk	active
Curbside frontage (feet)	110	20	110
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	30	30	30
RCBL	12	12	12
Limo	-	-	-
Shared Van	-	-	-
Silver Line	8	8	8
Logan Express	10	10	10
Scheduled Bus	10	10	10
Charter Bus	3	3	3
Volume of vehicles using curbside (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	12
Limo	-	-	-
Shared Van	-	-	-
Silver Line	8	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

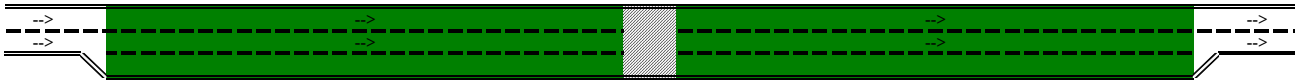
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb2
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	SL	CW	RCBL
Curb length (feet)	110	20	110
Zone type	active	xwalk	active
Roadway volume (vph)	73	73	73
Roadway capacity (vph)	2,343	2,657	2,343
Roadway V/C ratio	0.031	0.027	0.031
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	1.0	N/A	1.0
Curb capacity per lane (vehicles)	2.0	N/A	2.0
Curb utilization ratio	0.500	N/A	0.500
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	SL	CW	RCBL
Type of zone	active	xwalk	active
Curbside length (feet)	110	20	110
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	73	73	73
Curbside demand (vph)	8	-	12
Average dwell time (minutes)	0.80	-	0.95
Average vehicle length (feet)	70.00	-	70.00
Average vehicle arrival rate (vph)	8.00	-	12.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,468	2,797	2,468
Adjusted through lane roadway capacity	2,343	2,657	2,343
Estimated roadway V/C ratio	0.031	0.027	0.031
Curb capacity per lane (vehicles)	2.00	-	2.00
Curb utilization ratio	0.500	-	0.500
% occupancy in lane 1	0.490	-	0.490
% occupancy in lane 2	-	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	0.98	-	0.98
# of double-parked cars	-	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb2
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	SL	CW	RCBL
Type	active	xwalk	active
Curbside frontage (feet)	75	20	115
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	30	30	30
RCBL	12	12	12
Limo	-	-	-
Shared Van	-	-	-
Silver Line	8	8	8
Logan Express	10	10	10
Scheduled Bus	10	10	10
Charter Bus	3	3	3
Volume of vehicles using curbside (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	12
Limo	-	-	-
Shared Van	-	-	-
Silver Line	8	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

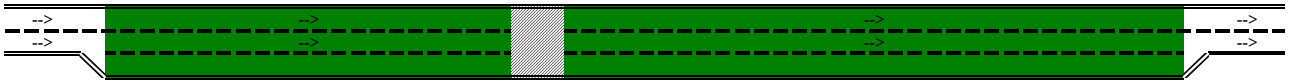
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb2
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	SL	CW	RCBL
Curb length (feet)	75	20	115
Zone type	active	xwalk	active
Roadway volume (vph)	73	73	73
Roadway capacity (vph)	1,976	2,657	2,343
Roadway V/C ratio	0.037	0.027	0.031
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	1.0	N/A	1.0
Curb capacity per lane (vehicles)	1.0	N/A	2.0
Curb utilization ratio	1.000	N/A	0.500
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	SL	CW	RCBL
Type of zone	active	xwalk	active
Curbside length (feet)	75	20	115
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	73	73	73
Curbside demand (vph)	8	-	12
Average dwell time (minutes)	0.80	-	0.95
Average vehicle length (feet)	70.00	-	70.00
Average vehicle arrival rate (vph)	8.00	-	12.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	2,797	2,468
Adjusted through lane roadway capacity	1,976	2,657	2,343
Estimated roadway V/C ratio	0.037	0.027	0.031
Curb capacity per lane (vehicles)	1.00	-	2.00
Curb utilization ratio	1.000	-	0.500
% occupancy in lane 1	0.895	-	0.490
% occupancy in lane 2	0.095	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	0.90	-	0.98
# of double-parked cars	0.10	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb2
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3
Name	SL	CW	RCBL
Type	active	xwalk	active
Curbside frontage (feet)	75	20	115
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Volume of vehicles using roadway (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	30	30	30
RCBL	12	12	12
Limo	-	-	-
Shared Van	-	-	-
Silver Line	8	8	8
Logan Express	10	10	10
Scheduled Bus	10	10	10
Charter Bus	3	3	3
Volume of vehicles using curbside (vph)			
Private Vehicle Pick-Up	-	-	-
Taxicabs	-	-	-
TNC	-	-	-
MPA Economy Parking	-	-	-
MPA Employee	-	-	-
MPA Water Taxi	-	-	-
MPA Interterminal	-	-	-
Courtesy Shuttle	-	-	-
RCBL	-	-	12
Limo	-	-	-
Shared Van	-	-	-
Silver Line	8	-	-
Logan Express	-	-	-
Scheduled Bus	-	-	-
Charter Bus	-	-	-

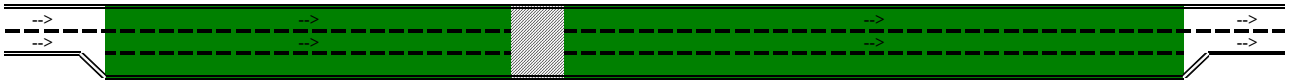
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb2
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	3



Zone ID	Zone 1	Zone 2	Zone 3
Name/description	SL	CW	RCBL
Curb length (feet)	75	20	115
Zone type	active	xwalk	active
Roadway volume (vph)	73	73	73
Roadway capacity (vph)	1,976	2,657	2,343
Roadway V/C ratio	0.037	0.027	0.031
Roadway LOS	A	A	A
Curb demand (# in sys 95% of time)	1.0	N/A	1.0
Curb capacity per lane (vehicles)	1.0	N/A	2.0
Curb utilization ratio	1.000	N/A	0.500
Curb LOS	A	N/A	A

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3
Name	SL	CW	RCBL
Type of zone	active	xwalk	active
Curbside length (feet)	75	20	115
Number of lanes	3	3	3
Number of approach lanes	2	2	2
Roadway volume (vph)	73	73	73
Curbside demand (vph)	8	-	12
Average dwell time (minutes)	0.80	-	0.95
Average vehicle length (feet)	70.00	-	70.00
Average vehicle arrival rate (vph)	8.00	-	12.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	2,797	2,468
Adjusted through lane roadway capacity	1,976	2,657	2,343
Estimated roadway V/C ratio	0.037	0.027	0.031
Curb capacity per lane (vehicles)	1.00	-	2.00
Curb utilization ratio	1.000	-	0.500
% occupancy in lane 1	0.895	-	0.490
% occupancy in lane 2	0.095	-	-
% occupancy in lane 3	-	-	-
# of cars in curbside lane	0.90	-	0.98
# of double-parked cars	0.10	-	-
# of triple-parked cars	-	-	-
Curbside LOS	A		A
Roadway LOS	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb3
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	SV	PP	CW	PP
Type	active	active	xwalk	active
Curbside frontage (feet)	70	60	20	130
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Volume of vehicles using roadway (vph)				
Private Vehicle Pick-Up	93	93	93	93
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	-
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	15	15	15	15
Silver Line	-	-	-	-
Logan Express	-	-	-	-
Scheduled Bus	-	-	-	-
Charter Bus	-	-	-	-
Volume of vehicles using curbside (vph)				
Private Vehicle Pick-Up	-	29	-	64
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	-
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	15	-	-	-
Silver Line	-	-	-	-
Logan Express	-	-	-	-
Scheduled Bus	-	-	-	-
Charter Bus	-	-	-	-

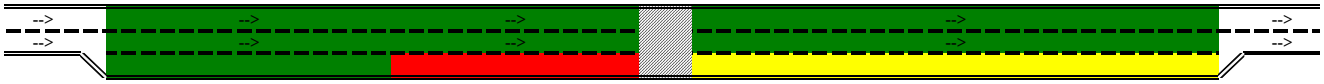
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb3
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name/description	SV	PP	CW	PP
Curb length (feet)	70	60	20	130
Zone type	active	active	xwalk	active
Roadway volume (vph)	108	108	108	108
Roadway capacity (vph)	2,343	722	2,657	1,676
Roadway V/C ratio	0.046	0.150	0.041	0.064
Roadway LOS	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	4.0	N/A	6.0
Curb capacity per lane (vehicles)	2.0	2.0	N/A	5.0
Curb utilization ratio	0.500	2.000	N/A	1.200
Curb LOS	A	E	N/A	C

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	SV	PP	CW	PP
Type of zone	active	active	xwalk	active
Curbside length (feet)	70	60	20	130
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Roadway volume (vph)	108	108	108	108
Curbside demand (vph)	15	29	-	64
Average dwell time (minutes)	0.65	2.90	-	2.90
Average vehicle length (feet)	30.00	25.00	-	25.00
Average vehicle arrival rate (vph)	15.00	29.00	-	64.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,468	760	2,797	1,765
Adjusted through lane roadway capacity	2,343	722	2,657	1,676
Estimated roadway V/C ratio	0.046	0.150	0.041	0.064
Curb capacity per lane (vehicles)	2.00	2.00	-	5.00
Curb utilization ratio	0.500	2.000	-	1.200
% occupancy in lane 1	0.490	1.000	-	0.995
% occupancy in lane 2	-	0.745	-	0.195
% occupancy in lane 3	-	0.25	-	-
# of cars in curbside lane	0.98	2.00	-	4.98
# of double-parked cars	-	1.49	-	0.98
# of triple-parked cars	-	0.490	-	-
Curbside LOS	A	E		C
Roadway LOS	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb3
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	SV	PP	CW	PP
Type	active	active	xwalk	active
Curbside frontage (feet)	70	60	20	130
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Volume of vehicles using roadway (vph)				
Private Vehicle Pick-Up	118	118	118	118
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	-
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	15	15	15	15
Silver Line	-	-	-	-
Logan Express	-	-	-	-
Scheduled Bus	-	-	-	-
Charter Bus	-	-	-	-
Volume of vehicles using curbside (vph)				
Private Vehicle Pick-Up	-	38	-	80
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	-
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	15	-	-	-
Silver Line	-	-	-	-
Logan Express	-	-	-	-
Scheduled Bus	-	-	-	-
Charter Bus	-	-	-	-

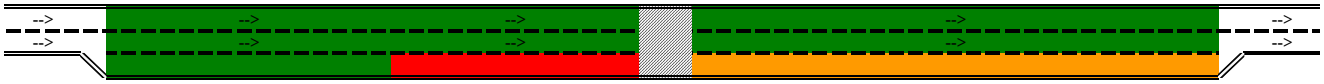
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb3
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name/description	SV	PP	CW	PP
Curb length (feet)	70	60	20	130
Zone type	active	active	xwalk	active
Roadway volume (vph)	133	133	133	133
Roadway capacity (vph)	2,343	722	2,657	1,318
Roadway V/C ratio	0.057	0.184	0.050	0.101
Roadway LOS	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	4.0	N/A	7.0
Curb capacity per lane (vehicles)	2.0	2.0	N/A	5.0
Curb utilization ratio	0.500	2.000	N/A	1.400
Curb LOS	A	E	N/A	D

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	SV	PP	CW	PP
Type of zone	active	active	xwalk	active
Curbside length (feet)	70	60	20	130
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Roadway volume (vph)	133	133	133	133
Curbside demand (vph)	15	38	-	80
Average dwell time (minutes)	0.65	2.90	-	2.90
Average vehicle length (feet)	30.00	25.00	-	25.00
Average vehicle arrival rate (vph)	15.00	38.00	-	80.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,468	760	2,797	1,389
Adjusted through lane roadway capacity	2,343	722	2,657	1,318
Estimated roadway V/C ratio	0.057	0.184	0.050	0.101
Curb capacity per lane (vehicles)	2.00	2.00	-	5.00
Curb utilization ratio	0.500	2.000	-	1.400
% occupancy in lane 1	0.490	1.000	-	1.000
% occupancy in lane 2	-	0.745	-	0.390
% occupancy in lane 3	-	0.25	-	-
# of cars in curbside lane	0.98	2.00	-	5.00
# of double-parked cars	-	1.49	-	1.95
# of triple-parked cars	-	0.490	-	-
Curbside LOS	A	E		D
Roadway LOS	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb3
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	SV	PP	CW	PP
Type	active	active	xwalk	active
Curbside frontage (feet)	70	60	20	130
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Volume of vehicles using roadway (vph)				
Private Vehicle Pick-Up	129	129	129	129
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	-
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	15	15	15	15
Silver Line	-	-	-	-
Logan Express	-	-	-	-
Scheduled Bus	-	-	-	-
Charter Bus	-	-	-	-
Volume of vehicles using curbside (vph)				
Private Vehicle Pick-Up	-	41	-	88
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	-
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	15	-	-	-
Silver Line	-	-	-	-
Logan Express	-	-	-	-
Scheduled Bus	-	-	-	-
Charter Bus	-	-	-	-

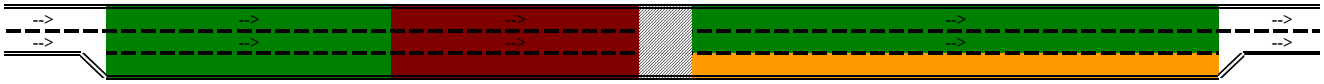
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb3
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name/description	SV	PP	CW	PP
Curb length (feet)	70	60	20	130
Zone type	active	active	xwalk	active
Roadway volume (vph)	144	144	144	144
Roadway capacity (vph)	2,343	0	2,657	974
Roadway V/C ratio	0.061	1000000.000	0.054	0.148
Roadway LOS	A	F	A	A
Curb demand (# in sys 95% of time)	1.0	5.0	N/A	8.0
Curb capacity per lane (vehicles)	2.0	2.0	N/A	5.0
Curb utilization ratio	0.500	2.500	N/A	1.600
Curb LOS	A	F	N/A	D

Level-of-service (LOS) key:

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	SV	PP	CW	PP
Type of zone	active	active	xwalk	active
Curbside length (feet)	70	60	20	130
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Roadway volume (vph)	144	144	144	144
Curbside demand (vph)	15	41	-	88
Average dwell time (minutes)	0.65	2.90	-	2.90
Average vehicle length (feet)	30.00	25.00	-	25.00
Average vehicle arrival rate (vph)	15.00	41.00	-	88.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,468	-	2,797	1,026
Adjusted through lane roadway capacity	2,343	-	2,657	974
Estimated roadway V/C ratio	0.061	##########	0.054	0.148
Curb capacity per lane (vehicles)	2.00	2.00	-	5.00
Curb utilization ratio	0.500	2.500	-	1.600
% occupancy in lane 1	0.490	1.000	-	1.000
% occupancy in lane 2	-	1.000	-	0.545
% occupancy in lane 3	-	0.50	-	0.05
# of cars in curbside lane	0.98	2.00	-	5.00
# of double-parked cars	-	2.00	-	2.73
# of triple-parked cars	-	1.000	-	0.225
Curbside LOS	A	F		D
Roadway LOS	A	F	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb4
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	1
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1
Name	PP
Type	active
Curbside frontage (feet)	310
Number of lanes	3
Number of approach lanes	2

Volume of vehicles using roadway (vph)

Private Vehicle Pick-Up	165
Taxicabs	-
TNC	-
MPA Economy Parking	-
MPA Employee	-
MPA Water Taxi	-
MPA Interterminal	-
Courtesy Shuttle	-
RCBL	-
Limo	-
Shared Van	-
Silver Line	-
Logan Express	-
Scheduled Bus	-
Charter Bus	-

Volume of vehicles using curbside (vph)

Private Vehicle Pick-Up	165
Taxicabs	-
TNC	-
MPA Economy Parking	-
MPA Employee	-
MPA Water Taxi	-
MPA Interterminal	-
Courtesy Shuttle	-
RCBL	-
Limo	-
Shared Van	-
Silver Line	-
Logan Express	-
Scheduled Bus	-
Charter Bus	-

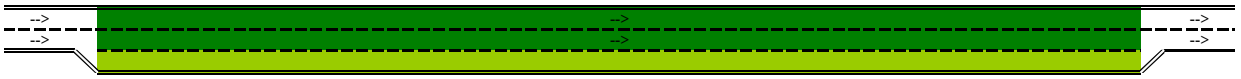
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals Curb4
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	1



Zone ID	**Zone 1**
Name/description	PP
Curb length (feet)	310
Zone type	active
Roadway volume (vph)	165
Roadway capacity (vph)	1,866
Roadway V/C ratio	0.088
Roadway LOS	A
Curb demand (# in sys 95% of time)	13.0
Curb capacity per lane (vehicles)	12.0
Curb utilization ratio	1.083
Curb LOS	B

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1
Name	PP
Type of zone	active
Curbside length (feet)	310
Number of lanes	3
Number of approach lanes	2
Roadway volume (vph)	165
Curbside demand (vph)	165
Average dwell time (minutes)	2.90
Average vehicle length (feet)	25.00
Average vehicle arrival rate (vph)	165.00
Crosswalk adjustment factor	100.0%
Regional adjustment factor	95.0%
Through lane roadway capacity	1,965
Adjusted through lane roadway capacity	1,866
Estimated roadway V/C ratio	0.088
Curb capacity per lane (vehicles)	12.00
Curb utilization ratio	1.083
% occupancy in lane 1	0.940
% occupancy in lane 2	0.140
% occupancy in lane 3	-
# of cars in curbside lane	11.28
# of double-parked cars	1.68
# of triple-parked cars	-
Curbside LOS	B
Roadway LOS	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb4
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	1
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1
Name	PP
Type	active
Curbside frontage (feet)	170
Number of lanes	3
Number of approach lanes	2

Volume of vehicles using roadway (vph)

Private Vehicle Pick-Up	118
Taxicabs	-
TNC	-
MPA Economy Parking	-
MPA Employee	-
MPA Water Taxi	-
MPA Interterminal	-
Courtesy Shuttle	-
RCBL	-
Limo	-
Shared Van	-
Silver Line	-
Logan Express	-
Scheduled Bus	-
Charter Bus	-

Volume of vehicles using curbside (vph)

Private Vehicle Pick-Up	118
Taxicabs	-
TNC	-
MPA Economy Parking	-
MPA Employee	-
MPA Water Taxi	-
MPA Interterminal	-
Courtesy Shuttle	-
RCBL	-
Limo	-
Shared Van	-
Silver Line	-
Logan Express	-
Scheduled Bus	-
Charter Bus	-

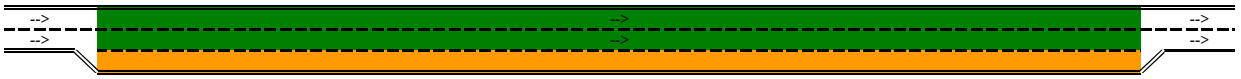
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals Curb4
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	1



Zone ID	**Zone 1**
Name/description	PP
Curb length (feet)	170
Zone type	active
Roadway volume (vph)	118
Roadway capacity (vph)	1,282
Roadway V/C ratio	0.092
Roadway LOS	A
Curb demand (# in sys 95% of time)	10.0
Curb capacity per lane (vehicles)	7.0
Curb utilization ratio	1.429
Curb LOS	D

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1
Name	PP
Type of zone	active
Curbside length (feet)	170
Number of lanes	3
Number of approach lanes	2
Roadway volume (vph)	118
Curbside demand (vph)	118
Average dwell time (minutes)	2.90
Average vehicle length (feet)	25.00
Average vehicle arrival rate (vph)	118.00
Crosswalk adjustment factor	100.0%
Regional adjustment factor	95.0%
Through lane roadway capacity	1,350
Adjusted through lane roadway capacity	1,282
Estimated roadway V/C ratio	0.092
Curb capacity per lane (vehicles)	7.00
Curb utilization ratio	1.429
% occupancy in lane 1	1.000
% occupancy in lane 2	0.420
% occupancy in lane 3	-
# of cars in curbside lane	7.00
# of double-parked cars	2.94
# of triple-parked cars	-
Curbside LOS	D
Roadway LOS	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb4
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	1
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1
Name	PP
Type	active
Curbside frontage (feet)	170
Number of lanes	3
Number of approach lanes	2

Volume of vehicles using roadway (vph)

Private Vehicle Pick-Up	129
Taxicabs	-
TNC	-
MPA Economy Parking	-
MPA Employee	-
MPA Water Taxi	-
MPA Interterminal	-
Courtesy Shuttle	-
RCBL	-
Limo	-
Shared Van	-
Silver Line	-
Logan Express	-
Scheduled Bus	-
Charter Bus	-

Volume of vehicles using curbside (vph)

Private Vehicle Pick-Up	129
Taxicabs	-
TNC	-
MPA Economy Parking	-
MPA Employee	-
MPA Water Taxi	-
MPA Interterminal	-
Courtesy Shuttle	-
RCBL	-
Limo	-
Shared Van	-
Silver Line	-
Logan Express	-
Scheduled Bus	-
Charter Bus	-

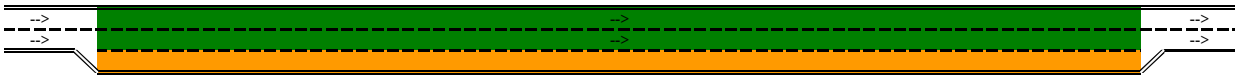
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals Curb4
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	1



Zone ID	**Zone 1**
Name/description	PP
Curb length (feet)	170
Zone type	active
Roadway volume (vph)	129
Roadway capacity (vph)	1,021
Roadway V/C ratio	0.126
Roadway LOS	A
Curb demand (# in sys 95% of time)	11.0
Curb capacity per lane (vehicles)	7.0
Curb utilization ratio	1.571
Curb LOS	D

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1
Name	PP
Type of zone	active
Curbside length (feet)	170
Number of lanes	3
Number of approach lanes	2
Roadway volume (vph)	129
Curbside demand (vph)	129
Average dwell time (minutes)	2.90
Average vehicle length (feet)	25.00
Average vehicle arrival rate (vph)	129.00
Crosswalk adjustment factor	100.0%
Regional adjustment factor	95.0%
Through lane roadway capacity	1,076
Adjusted through lane roadway capacity	1,021
Estimated roadway V/C ratio	0.126
Curb capacity per lane (vehicles)	7.00
Curb utilization ratio	1.571
% occupancy in lane 1	1.000
% occupancy in lane 2	0.535
% occupancy in lane 3	0.04
# of cars in curbside lane	7.00
# of double-parked cars	3.75
# of triple-parked cars	0.245
Curbside LOS	D
Roadway LOS	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals CurbD
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	LE	SchBus	Charter	Courtesy
Type	active	active	active	active
Curbside frontage (feet)	80	65	60	50
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Volume of vehicles using roadway (vph)				
Private Vehicle Pick-Up	-	-	-	-
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	16	16	16	16
Courtesy Shuttle	30	30	30	30
RCBL	12	12	12	12
Limo	-	-	-	-
Shared Van	15	15	15	15
Silver Line	8	8	8	8
Logan Express	10	10	10	10
Scheduled Bus	10	10	10	10
Charter Bus	3	3	3	3
Volume of vehicles using curbside (vph)				
Private Vehicle Pick-Up	-	-	-	-
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	30
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	-	-	-	-
Silver Line	-	-	-	-
Logan Express	10	-	-	-
Scheduled Bus	-	10	-	-
Charter Bus	-	-	3	-

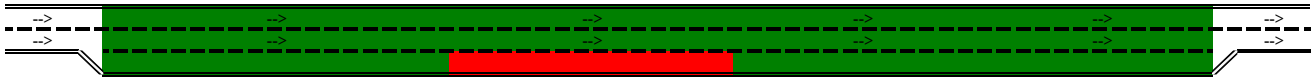
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	B 46.5 MAP - Arrivals CurbD
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name/description	LE	SchBus	Charter	Courtesy
Curb length (feet)	80	65	60	50
Zone type	active	active	active	active
Roadway volume (vph)	104	104	104	104
Roadway capacity (vph)	1,976	722	1,976	1,976
Roadway V/C ratio	0.053	0.144	0.053	0.053
Roadway LOS	A	A	A	A
Curb demand (# in sys 95% of time)	2.0	2.0	1.0	1.0
Curb capacity per lane (vehicles)	2.0	1.0	1.0	1.0
Curb utilization ratio	1.000	2.000	1.000	1.000
Curb LOS	A	E	A	A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	LE	SchBus	Charter	Courtesy
Type of zone	active	active	active	active
Curbside length (feet)	80	65	60	50
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Roadway volume (vph)	104	104	104	104
Curbside demand (vph)	10	10	3	30
Average dwell time (minutes)	3.00	2.40	2.97	0.65
Average vehicle length (feet)	50.00	50.00	50.00	40.00
Average vehicle arrival rate (vph)	10.00	10.00	3.00	30.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	760	2,082	2,082
Adjusted through lane roadway capacity	1,976	722	1,976	1,976
Estimated roadway V/C ratio	0.053	0.144	0.053	0.053
Curb capacity per lane (vehicles)	2.00	1.00	1.00	1.00
Curb utilization ratio	1.000	2.000	1.000	1.000
% occupancy in lane 1	0.895	1.000	0.895	0.895
% occupancy in lane 2	0.095	0.745	0.095	0.095
% occupancy in lane 3	-	0.25	-	-
# of cars in curbside lane	1.79	1.00	0.90	0.90
# of double-parked cars	0.19	0.75	0.10	0.10
# of triple-parked cars	-	0.245	-	-
Curbside LOS	A	E	A	A
Roadway LOS	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals CurbD
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	LE	SchBus	Charter	Courtesy
Type	active	active	active	active
Curbside frontage (feet)	80	65	60	50
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Volume of vehicles using roadway (vph)				
Private Vehicle Pick-Up	-	-	-	-
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	16	16	16	16
Courtesy Shuttle	30	30	30	30
RCBL	12	12	12	12
Limo	-	-	-	-
Shared Van	15	15	15	15
Silver Line	8	8	8	8
Logan Express	10	10	10	10
Scheduled Bus	10	10	10	10
Charter Bus	3	3	3	3
Volume of vehicles using curbside (vph)				
Private Vehicle Pick-Up	-	-	-	-
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	30
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	-	-	-	-
Silver Line	-	-	-	-
Logan Express	10	-	-	-
Scheduled Bus	-	10	-	-
Charter Bus	-	-	3	-

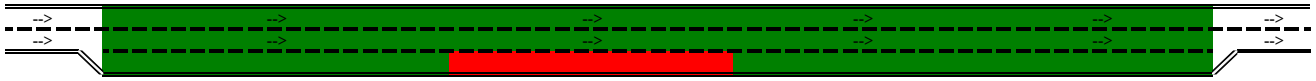
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	EXISTING- Arrivals CurbD
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name/description	LE	SchBus	Charter	Courtesy
Curb length (feet)	80	65	60	50
Zone type	active	active	active	active
Roadway volume (vph)	104	104	104	104
Roadway capacity (vph)	1,976	722	1,976	1,976
Roadway V/C ratio	0.053	0.144	0.053	0.053
Roadway LOS	A	A	A	A
Curb demand (# in sys 95% of time)	2.0	2.0	1.0	1.0
Curb capacity per lane (vehicles)	2.0	1.0	1.0	1.0
Curb utilization ratio	1.000	2.000	1.000	1.000
Curb LOS	A	E	A	A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	LE	SchBus	Charter	Courtesy
Type of zone	active	active	active	active
Curbside length (feet)	80	65	60	50
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Roadway volume (vph)	104	104	104	104
Curbside demand (vph)	10	10	3	30
Average dwell time (minutes)	3.00	2.40	2.97	0.65
Average vehicle length (feet)	50.00	50.00	50.00	40.00
Average vehicle arrival rate (vph)	10.00	10.00	3.00	30.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	760	2,082	2,082
Adjusted through lane roadway capacity	1,976	722	1,976	1,976
Estimated roadway V/C ratio	0.053	0.144	0.053	0.053
Curb capacity per lane (vehicles)	2.00	1.00	1.00	1.00
Curb utilization ratio	1.000	2.000	1.000	1.000
% occupancy in lane 1	0.895	1.000	0.895	0.895
% occupancy in lane 2	0.095	0.745	0.095	0.095
% occupancy in lane 3	-	0.25	-	-
# of cars in curbside lane	1.79	1.00	0.90	0.90
# of double-parked cars	0.19	0.75	0.10	0.10
# of triple-parked cars	-	0.245	-	-
Curbside LOS	A	E	A	A
Roadway LOS	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals CurbD
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private Vehicle Pick-Up	25.0	2.9
Taxicabs	25.0	0.6
TNC	25.0	0.6
MPA Economy Parking	40.0	0.7
MPA Employee	40.0	0.7
MPA Water Taxi	40.0	0.7
MPA Interterminal	40.0	0.7
Courtesy Shuttle	40.0	0.7
RCBL	70.0	1.0
Limo	30.0	0.9
Shared Van	30.0	0.7
Silver Line	70	1
Logan Express	50	3
Scheduled Bus	50	2
Charter Bus	50	3

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	LE	SchBus	Charter	Courtesy
Type	active	active	active	active
Curbside frontage (feet)	80	65	60	50
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Volume of vehicles using roadway (vph)				
Private Vehicle Pick-Up	-	-	-	-
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	16	16	16	16
Courtesy Shuttle	30	30	30	30
RCBL	12	12	12	12
Limo	-	-	-	-
Shared Van	15	15	15	15
Silver Line	8	8	8	8
Logan Express	10	10	10	10
Scheduled Bus	10	10	10	10
Charter Bus	3	3	3	3
Volume of vehicles using curbside (vph)				
Private Vehicle Pick-Up	-	-	-	-
Taxicabs	-	-	-	-
TNC	-	-	-	-
MPA Economy Parking	-	-	-	-
MPA Employee	-	-	-	-
MPA Water Taxi	-	-	-	-
MPA Interterminal	-	-	-	-
Courtesy Shuttle	-	-	-	30
RCBL	-	-	-	-
Limo	-	-	-	-
Shared Van	-	-	-	-
Silver Line	-	-	-	-
Logan Express	10	-	-	-
Scheduled Bus	-	10	-	-
Charter Bus	-	-	3	-

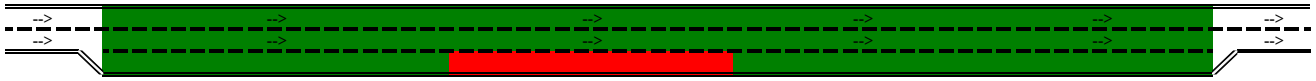
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: ACF on 5/8/2018

Airport	BOS
Roadway location	Terminal C
Scenario	NB 46.5 MAP - Arrivals CurbD
Level / type of roadway	Arrivals
Total lanes / approach lanes	3 / 2
Number of curbside zones	4



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4
Name/description	LE	SchBus	Charter	Courtesy
Curb length (feet)	80	65	60	50
Zone type	active	active	active	active
Roadway volume (vph)	104	104	104	104
Roadway capacity (vph)	1,976	722	1,976	1,976
Roadway V/C ratio	0.053	0.144	0.053	0.053
Roadway LOS	A	A	A	A
Curb demand (# in sys 95% of time)	2.0	2.0	1.0	1.0
Curb capacity per lane (vehicles)	2.0	1.0	1.0	1.0
Curb utilization ratio	1.000	2.000	1.000	1.000
Curb LOS	A	E	A	A

Level-of-service (LOS) key:

A
B
C
D
E
F

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: ACF on 5/8/2018

ID	Zone 1	Zone 2	Zone 3	Zone 4
Name	LE	SchBus	Charter	Courtesy
Type of zone	active	active	active	active
Curbside length (feet)	80	65	60	50
Number of lanes	3	3	3	3
Number of approach lanes	2	2	2	2
Roadway volume (vph)	104	104	104	104
Curbside demand (vph)	10	10	3	30
Average dwell time (minutes)	3.00	2.40	2.97	0.65
Average vehicle length (feet)	50.00	50.00	50.00	40.00
Average vehicle arrival rate (vph)	10.00	10.00	3.00	30.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,082	760	2,082	2,082
Adjusted through lane roadway capacity	1,976	722	1,976	1,976
Estimated roadway V/C ratio	0.053	0.144	0.053	0.053
Curb capacity per lane (vehicles)	2.00	1.00	1.00	1.00
Curb utilization ratio	1.000	2.000	1.000	1.000
% occupancy in lane 1	0.895	1.000	0.895	0.895
% occupancy in lane 2	0.095	0.745	0.095	0.095
% occupancy in lane 3	-	0.25	-	-
# of cars in curbside lane	1.79	1.00	0.90	0.90
# of double-parked cars	0.19	0.75	0.10	0.10
# of triple-parked cars	-	0.245	-	-
Curbside LOS	A	E	A	A
Roadway LOS	A	A	A	A

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Appendix C

Air Quality

- MOVES Output Supporting Documents
- Aermod Outputs Supporting Documents
- Background Concentrations
- Emission Assessment

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Moves Output Supporting Documents

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2030 MOVES Output

yearID	monthID	dayID	hourID	stateID	countyID	zoneID	linkID	pollutantID	emissionQuant	massUnits
2030	4	5	9	25	25025	250250	4	119	0	g
2030	4	5	9	25	25025	250250	3	119	0	g
2030	4	5	9	25	25025	250250	2	119	0	g
2030	4	5	9	25	25025	250250	1	119	0	g
2030	1	5	9	25	25025	250250	1	2	4.749787807	g
2030	1	5	9	25	25025	250250	2	2	4.047399998	g
2030	1	5	9	25	25025	250250	3	2	0.553353071	g
2030	1	5	9	25	25025	250250	4	2	3.787410259	g
2030	4	5	9	25	25025	250250	4	118	0.017243501	g
2030	4	5	9	25	25025	250250	3	118	0.025426401	g
2030	4	5	9	25	25025	250250	2	118	0.228446007	g
2030	4	5	9	25	25025	250250	1	118	0.191393003	g
2030	4	5	9	25	25025	250250	4	115	0.00345051	g
2030	4	5	9	25	25025	250250	3	115	0.00113259	g
2030	4	5	9	25	25025	250250	2	115	0.169049993	g
2030	4	5	9	25	25025	250250	1	115	0.138254002	g
2030	4	5	9	25	25025	250250	4	112	0.00276776	g
2030	4	5	9	25	25025	250250	3	112	0.00433226	g
2030	4	5	9	25	25025	250250	2	112	0.0253384	g
2030	4	5	9	25	25025	250250	1	112	0.021344	g
2030	1	5	9	25	25025	250250	1	110	0.236818001	g
2030	1	5	9	25	25025	250250	2	110	0.283291996	g
2030	1	5	9	25	25025	250250	3	110	0.0298509	g
2030	1	5	9	25	25025	250250	4	110	0.0201481	g
2030	7	5	9	25	25025	250250	4	119	0	g
2030	7	5	9	25	25025	250250	3	119	0	g
2030	7	5	9	25	25025	250250	2	119	0	g
2030	7	5	9	25	25025	250250	1	119	0	g
2030	7	5	9	25	25025	250250	4	118	0.01723	g
2030	7	5	9	25	25025	250250	3	118	0.024930499	g
2030	7	5	9	25	25025	250250	2	118	0.228446007	g
2030	7	5	9	25	25025	250250	1	118	0.191393003	g
2030	7	5	9	25	25025	250250	4	115	0.00344918	g
2030	7	5	9	25	25025	250250	3	115	0.00111396	g
2030	7	5	9	25	25025	250250	2	115	0.169049993	g
2030	7	5	9	25	25025	250250	1	115	0.138254002	g
2030	7	5	9	25	25025	250250	4	112	0.00276561	g
2030	7	5	9	25	25025	250250	3	112	0.00424779	g
2030	7	5	9	25	25025	250250	2	112	0.0253384	g
2030	7	5	9	25	25025	250250	1	112	0.021344	g
2030	4	5	9	25	25025	250250	1	110	0.212736994	g
2030	4	5	9	25	25025	250250	2	110	0.253785014	g
2030	4	5	9	25	25025	250250	3	110	0.029758699	g
2030	4	5	9	25	25025	250250	4	110	0.0200112	g
2030	10	5	9	25	25025	250250	4	119	0	g
2030	10	5	9	25	25025	250250	3	119	0	g
2030	10	5	9	25	25025	250250	2	119	0	g
2030	10	5	9	25	25025	250250	1	119	0	g
2030	10	5	9	25	25025	250250	4	118	0.0172337	g
2030	10	5	9	25	25025	250250	3	118	0.025290599	g
2030	10	5	9	25	25025	250250	2	118	0.228446007	g
2030	10	5	9	25	25025	250250	1	118	0.191393003	g
2030	10	5	9	25	25025	250250	4	115	0.00345015	g
2030	10	5	9	25	25025	250250	3	115	0.0011276	g
2030	10	5	9	25	25025	250250	2	115	0.169049993	g
2030	10	5	9	25	25025	250250	1	115	0.138254002	g
2030	10	5	9	25	25025	250250	4	112	0.0027661	g
2030	10	5	9	25	25025	250250	3	112	0.0043091	g
2030	10	5	9	25	25025	250250	2	112	0.0253384	g

2030	10	5	9	25	25025	250250	1	112	0.021344 g
2030	7	5	9	25	25025	250250	1	110	0.212736994 g
2030	7	5	9	25	25025	250250	2	110	0.253785014 g
2030	7	5	9	25	25025	250250	3	110	0.0291782 g
2030	7	5	9	25	25025	250250	4	110	0.0199956 g
2030	1	5	9	25	25025	250250	4	119	0 g
2030	1	5	9	25	25025	250250	3	119	0 g
2030	1	5	9	25	25025	250250	2	119	0 g
2030	1	5	9	25	25025	250250	1	119	0 g
2030	1	5	9	25	25025	250250	4	118	0.0174265 g
2030	1	5	9	25	25025	250250	3	118	0.025487 g
2030	1	5	9	25	25025	250250	2	118	0.257952988 g
2030	1	5	9	25	25025	250250	1	118	0.215478003 g
2030	1	5	9	25	25025	250250	4	115	0.00388104 g
2030	1	5	9	25	25025	250250	3	115	0.00101466 g
2030	1	5	9	25	25025	250250	2	115	0.198557004 g
2030	1	5	9	25	25025	250250	1	115	0.162364006 g
2030	1	5	9	25	25025	250250	4	112	0.00272156 g
2030	1	5	9	25	25025	250250	3	112	0.00436385 g
2030	1	5	9	25	25025	250250	2	112	0.0253384 g
2030	1	5	9	25	25025	250250	1	112	0.021339601 g
2030	10	5	9	25	25025	250250	1	110	0.212736994 g
2030	10	5	9	25	25025	250250	2	110	0.253785014 g
2030	10	5	9	25	25025	250250	3	110	0.0295997 g
2030	10	5	9	25	25025	250250	4	110	0.0199998 g

Aermod Outputs Supporting Documents

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BREEZE AERMOD Model Results

Highest Results of Pollutant: CO

Avg. Per.	Grp ID	High	Type	Val	Units	Date	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
						YYMMDDHH	East (m)	North (m)	(m)	(m)	(m)		
1-HR	ALL	2ND	Avg. Conc.	1299.54631	ug/m**3	13010805	333884.10	4692429.55	0.00	0.00	1.82	GP	UXFOB000
8-HR	ALL	2ND	Avg. Conc.	577.50514	ug/m**3	13052324	333895.10	4692414.60	0.00	0.00	1.82	GP	UXFOB000

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
17	Informational Message(s)
8760	Hours Were Processed
10	Calm Hours Identified
7	Missing Hours Identified (0.08 Percent)

Error & Warning Messages

Msg. Type	Pathway	Ref. #	Description
WARNING	ME	W186	THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE

BREEZE AERMOD Model Results

Max. Annual (1 YEARS) Results of Pollutant: PM25 (ug/m**3)

Group ID	High	Avg. Conc.	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
			East (m)	North (m)	(m)	(m)	(m)		
ALL	1ST	1.56480	333878.19	4692454.76	0.00	0.00	1.82	GP	B6C8T000
	2ND	1.53650	333879.10	4692448.60	0.00	0.00	1.82	GP	B6C8T000
	3RD	1.53026	333876.31	4692455.44	0.00	0.00	1.82	GP	B6C8T000
	4TH	1.51516	333877.37	4692451.73	0.00	0.00	1.82	GP	B6C8T000
	5TH	1.50866	333875.40	4692452.07	0.00	0.00	1.82	GP	B6C8T000
	6TH	1.47402	333879.34	4692451.38	0.00	0.00	1.82	GP	B6C8T000
	7TH	1.44821	333880.06	4692454.07	0.00	0.00	1.82	GP	B6C8T000
	8TH	1.44677	333877.10	4692448.60	0.00	0.00	1.82	GP	B6C8T000
	9TH	1.44004	333872.55	4692456.81	0.00	0.00	1.82	GP	B6C8T000
	10TH	1.43120	333874.43	4692456.12	0.00	0.00	1.82	GP	B6C8T000

Maximum Period 24-HR Results Averaged Over (1 YEARS) of Pollutant: PM25 (ug/m**3)

Highest (Conc.)	Group ID	Highest (Receptor)	Avg. Conc.	UTM		Elevation	Hill Ht	Flag HT	Rec.Type	Grid ID
				East (m)	North (m)	(m)	(m)	(m)		
8TH-Highest	ALL	1ST	3.50970	333915.67	4692473.11	0.00	0.00	1.82	GP	B6C8T000
		2ND	3.48926	333895.10	4692406.60	0.00	0.00	1.82	GP	B6C8T000
		3RD	3.44935	333905.81	4692483.84	0.00	0.00	1.82	DC	
		4TH	3.36433	333889.26	4692488.20	0.00	0.00	1.82	DC	
		5TH	3.33780	333916.95	4692474.65	0.00	0.00	1.82	GP	B6C8T000
		6TH	3.24815	333910.15	4692489.95	0.00	0.00	1.82	GP	B6C8T000
		7TH	3.24744	333909.46	4692488.07	0.00	0.00	1.82	GP	B6C8T000
		8TH	3.21679	333908.78	4692486.19	0.00	0.00	1.82	GP	B6C8T000
		9TH	3.14218	333910.83	4692491.83	0.00	0.00	1.82	GP	B6C8T000
		10TH	3.12819	333895.10	4692408.60	0.00	0.00	1.82	GP	B6C8T000

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
17	Informational Message(s)
8760	Hours Were Processed
10	Calm Hours Identified
7	Missing Hours Identified (0.08 Percent)

BREEZE AERMOD Model Results

Highest Results of Pollutant: CO

Avg. Per.	Grp ID	High	Type	Val	Units	Date	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
						YYMMDDHH	East (m)	North (m)	(m)	(m)	(m)		
1-HR	ALL	2ND	Avg. Conc.	1383.95136	ug/m**3	14011001	333884.10	4692429.55	0.00	0.00	1.82	GP	XE32S000
8-HR	ALL	2ND	Avg. Conc.	503.35770	ug/m**3	14090524	333884.10	4692429.55	0.00	0.00	1.82	GP	XE32S000

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
29	Informational Message(s)
8760	Hours Were Processed
10	Calm Hours Identified
19	Missing Hours Identified (0.22 Percent)

Error & Warning Messages

Msg. Type	Pathway	Ref. #	Description
WARNING	ME	W186	THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE

BREEZE AERMOD Model Results

Max. Annual (1 YEARS) Results of Pollutant: PM25 (ug/m**3)

Group ID	High	Avg. Conc.	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
			East (m)	North (m)	(m)	(m)	(m)		
ALL	1ST	1.49997	333878.19	4692454.76	0.00	0.00	1.82	GP	E7YFP000
	2ND	1.49317	333879.10	4692448.60	0.00	0.00	1.82	GP	E7YFP000
	3RD	1.48273	333876.31	4692455.44	0.00	0.00	1.82	GP	E7YFP000
	4TH	1.46538	333875.40	4692452.07	0.00	0.00	1.82	GP	E7YFP000
	5TH	1.46434	333877.37	4692451.73	0.00	0.00	1.82	GP	E7YFP000
	6TH	1.42706	333877.10	4692448.60	0.00	0.00	1.82	GP	E7YFP000
	7TH	1.41325	333879.34	4692451.38	0.00	0.00	1.82	GP	E7YFP000
	8TH	1.40582	333872.55	4692456.81	0.00	0.00	1.82	GP	E7YFP000
	9TH	1.40129	333870.85	4692462.60	0.00	0.00	1.82	GP	E7YFP000
	10TH	1.39903	333874.43	4692456.12	0.00	0.00	1.82	GP	E7YFP000

Maximum Period 24-HR Results Averaged Over (1 YEARS) of Pollutant: PM25 (ug/m**3)

Highest (Conc.)	Group ID	Highest (Receptor)	Avg. Conc.	UTM		Elevation	Hill Ht	Flag HT	Rec.Type	Grid ID
				East (m)	North (m)	(m)	(m)	(m)		
8TH-Highest	ALL	1ST	4.07676	333916.95	4692474.65	0.00	0.00	1.82	GP	E7YFP000
		2ND	3.82915	333915.67	4692473.11	0.00	0.00	1.82	GP	E7YFP000
		3RD	3.75329	333894.41	4692452.54	0.00	0.00	1.82	GP	E7YFP000
		4TH	3.74675	333893.73	4692452.36	0.00	0.00	1.82	GP	E7YFP000
		5TH	3.74235	333894.06	4692454.51	0.00	0.00	1.82	GP	E7YFP000
		6TH	3.59872	333893.05	4692454.24	0.00	0.00	1.82	GP	E7YFP000
		7TH	3.58513	333893.10	4692452.06	0.00	0.00	1.82	GP	E7YFP000
		8TH	3.51647	333895.10	4692406.60	0.00	0.00	1.82	GP	E7YFP000
		9TH	3.40409	333892.53	4692451.66	0.00	0.00	1.82	GP	E7YFP000
		10TH	3.40016	333891.63	4692468.30	0.00	0.00	1.82	GP	E7YFP000

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
29	Informational Message(s)
8760	Hours Were Processed
10	Calm Hours Identified
19	Missing Hours Identified (0.22 Percent)

BREEZE AERMOD Model Results

Highest Results of Pollutant: CO

Avg. Per.	Grp ID	High	Type	Val	Units	Date	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
						YYMMDDHH	East (m)	North (m)	(m)	(m)	(m)		
1-HR	ALL	2ND	Avg. Conc.	1359.37999	ug/m**3	15010622	333884.10	4692429.55	0.00	0.00	1.82	GP	XE32S001
8-HR	ALL	2ND	Avg. Conc.	518.59441	ug/m**3	15041708	333884.10	4692429.55	0.00	0.00	1.82	GP	XE32S001

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
23	Informational Message(s)
8760	Hours Were Processed
11	Calm Hours Identified
12	Missing Hours Identified (0.14 Percent)

Error & Warning Messages

Msg. Type	Pathway	Ref. #	Description
WARNING	ME	W186	THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE

BREEZE AERMOD Model Results

Max. Annual (1 YEARS) Results of Pollutant: PM25 (ug/m**3)

Group ID	High	Avg. Conc.	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
			East (m)	North (m)	(m)	(m)	(m)		
ALL	1ST	1.59366	333879.10	4692448.60	0.00	0.00	1.82	GP	E7YFP001
	2ND	1.57404	333878.19	4692454.76	0.00	0.00	1.82	GP	E7YFP001
	3RD	1.53770	333877.37	4692451.73	0.00	0.00	1.82	GP	E7YFP001
	4TH	1.53064	333876.31	4692455.44	0.00	0.00	1.82	GP	E7YFP001
	5TH	1.51062	333875.40	4692452.07	0.00	0.00	1.82	GP	E7YFP001
	6TH	1.50409	333877.10	4692448.60	0.00	0.00	1.82	GP	E7YFP001
	7TH	1.49436	333879.34	4692451.38	0.00	0.00	1.82	GP	E7YFP001
	8TH	1.46492	333880.06	4692454.07	0.00	0.00	1.82	GP	E7YFP001
	9TH	1.45113	333870.85	4692462.60	0.00	0.00	1.82	GP	E7YFP001
	10TH	1.44915	333879.51	4692457.60	0.00	0.00	1.82	GP	E7YFP001

Maximum Period 24-HR Results Averaged Over (1 YEARS) of Pollutant: PM25 (ug/m**3)

Highest (Conc.)	Group ID	Highest (Receptor)	Avg. Conc.	UTM		Elevation	Hill Ht	Flag HT	Rec.Type	Grid ID
				East (m)	North (m)	(m)	(m)	(m)		
8TH-Highest	ALL	1ST	4.18412	333891.63	4692468.30	0.00	0.00	1.82	GP	E7YFP001
		2ND	4.04061	333893.73	4692452.36	0.00	0.00	1.82	GP	E7YFP001
		3RD	3.93807	333916.95	4692474.65	0.00	0.00	1.82	GP	E7YFP001
		4TH	3.93767	333894.41	4692452.54	0.00	0.00	1.82	GP	E7YFP001
		5TH	3.92145	333893.10	4692452.06	0.00	0.00	1.82	GP	E7YFP001
		6TH	3.86969	333859.86	4692419.03	0.00	0.00	1.82	GP	E7YFP001
		7TH	3.84586	333858.33	4692417.75	0.00	0.00	1.82	GP	E7YFP001
		8TH	3.84322	333915.67	4692473.11	0.00	0.00	1.82	GP	E7YFP001
		9TH	3.81918	333894.06	4692454.51	0.00	0.00	1.82	GP	E7YFP001
		10TH	3.80778	333890.77	4692468.26	0.00	0.00	1.82	DC	

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
23	Informational Message(s)
8760	Hours Were Processed
11	Calm Hours Identified
12	Missing Hours Identified (0.14 Percent)

BREEZE AERMOD Model Results

Highest Results of Pollutant: CO

Avg. Per.	Grp ID	High	Type	Val	Units	Date	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
						YYMMDDHH	East (m)	North (m)	(m)	(m)	(m)		
1-HR	ALL	2ND	Avg. Conc.	1341.16028	ug/m**3	16111407	333895.10	4692414.60	0.00	0.00	1.82	GP	E7YFP002
8-HR	ALL	2ND	Avg. Conc.	597.79787	ug/m**3	16010708	333884.10	4692429.55	0.00	0.00	1.82	GP	E7YFP002

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
49	Informational Message(s)
8784	Hours Were Processed
12	Calm Hours Identified
37	Missing Hours Identified (0.42 Percent)

Error & Warning Messages

Msg. Type	Pathway	Ref. #	Description
WARNING	ME	W186	THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE

BREEZE AERMOD Model Results

Max. Annual (1 YEARS) Results of Pollutant: PM25 (ug/m**3)

Group ID	High	Avg. Conc.	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
			East (m)	North (m)	(m)	(m)	(m)		
ALL	1ST	1.53436	333878.19	4692454.76	0.00	0.00	1.82	GP	E7YFP003
	2ND	1.51848	333879.10	4692448.60	0.00	0.00	1.82	GP	E7YFP003
	3RD	1.50049	333876.31	4692455.44	0.00	0.00	1.82	GP	E7YFP003
	4TH	1.48212	333877.37	4692451.73	0.00	0.00	1.82	GP	E7YFP003
	5TH	1.45543	333879.34	4692451.38	0.00	0.00	1.82	GP	E7YFP003
	6TH	1.45416	333875.40	4692452.07	0.00	0.00	1.82	GP	E7YFP003
	7TH	1.43833	333877.10	4692448.60	0.00	0.00	1.82	GP	E7YFP003
	8TH	1.42810	333880.06	4692454.07	0.00	0.00	1.82	GP	E7YFP003
	9TH	1.40450	333874.43	4692456.12	0.00	0.00	1.82	GP	E7YFP003
	10TH	1.40437	333879.51	4692457.60	0.00	0.00	1.82	GP	E7YFP003

Maximum Period 24-HR Results Averaged Over (1 YEARS) of Pollutant: PM25 (ug/m**3)

Highest (Conc.)	Group ID	Highest (Receptor)	Avg. Conc.	UTM		Elevation	Hill Ht	Flag HT	Rec.Type	Grid ID
				East (m)	North (m)	(m)	(m)	(m)		
8TH-Highest	ALL	1ST	4.17235	333916.95	4692474.65	0.00	0.00	1.82	GP	E7YFP003
		2ND	4.13308	333915.67	4692473.11	0.00	0.00	1.82	GP	E7YFP003
		3RD	3.89717	333891.63	4692468.30	0.00	0.00	1.82	GP	E7YFP003
		4TH	3.57721	333859.86	4692419.03	0.00	0.00	1.82	GP	E7YFP003
		5TH	3.55032	333858.33	4692417.75	0.00	0.00	1.82	GP	E7YFP003
		6TH	3.45004	333856.80	4692416.46	0.00	0.00	1.82	GP	E7YFP003
		7TH	3.44882	333890.77	4692468.26	0.00	0.00	1.82	DC	
		8TH	3.36908	333861.39	4692420.32	0.00	0.00	1.82	GP	E7YFP003
		9TH	3.36467	333860.46	4692428.60	0.00	0.00	1.82	GP	E7YFP003
		10TH	3.32505	333914.38	4692471.58	0.00	0.00	1.82	GP	E7YFP003

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
49	Informational Message(s)
8784	Hours Were Processed
12	Calm Hours Identified
37	Missing Hours Identified (0.42 Percent)

BREEZE AERMOD Model Results

Highest Results of Pollutant: CO

Avg. Per.	Grp ID	High	Type	Val	Units	Date	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
						YYMMDDHH	East (m)	North (m)	(m)	(m)	(m)		
1-HR	ALL	2ND	Avg. Conc.	1283.06021	ug/m**3	17011001	333884.10	4692429.55	0.00	0.00	1.82	GP	E7YFP004
8-HR	ALL	2ND	Avg. Conc.	507.91173	ug/m**3	17051808	333889.26	4692488.20	0.00	0.00	1.82	DC	

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
3	Warning Message(s)
29	Informational Message(s)
8760	Hours Were Processed
0	Calm Hours Identified
29	Missing Hours Identified (0.33 Percent)

Error & Warning Messages

Msg. Type	Pathway	Ref. #	Description
WARNING	ME	W186	THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE
WARNING	OU	W565	Possible Conflict With Dynamically Allocated FUNIT PLOTFILE

BREEZE AERMOD Model Results

Max. Annual (1 YEARS) Results of Pollutant: PM25 (ug/m**3)

Group ID	High	Avg. Conc.	UTM		Elev.	Hill Ht.	Flag Ht.	Rec. Type	Grid ID
			East (m)	North (m)	(m)	(m)	(m)		
ALL	1ST	1.52954	333878.19	4692454.76	0.00	0.00	1.82	GP	E7YFP005
	2ND	1.50193	333879.10	4692448.60	0.00	0.00	1.82	GP	E7YFP005
	3RD	1.49921	333876.31	4692455.44	0.00	0.00	1.82	GP	E7YFP005
	4TH	1.47242	333877.37	4692451.73	0.00	0.00	1.82	GP	E7YFP005
	5TH	1.45602	333875.40	4692452.07	0.00	0.00	1.82	GP	E7YFP005
	6TH	1.44372	333879.34	4692451.38	0.00	0.00	1.82	GP	E7YFP005
	7TH	1.44335	333870.85	4692462.60	0.00	0.00	1.82	GP	E7YFP005
	8TH	1.43315	333870.67	4692457.49	0.00	0.00	1.82	GP	E7YFP005
	9TH	1.42918	333880.06	4692454.07	0.00	0.00	1.82	GP	E7YFP005
	10TH	1.42585	333872.55	4692456.81	0.00	0.00	1.82	GP	E7YFP005

Maximum Period 24-HR Results Averaged Over (1 YEARS) of Pollutant: PM25 (ug/m**3)

Highest (Conc.)	Group ID	Highest (Receptor)	Avg. Conc.	UTM		Elevation	Hill Ht	Flag HT	Rec.Type	Grid ID
				East (m)	North (m)	(m)	(m)	(m)		
8TH-Highest	ALL	1ST	4.86320	333915.67	4692473.11	0.00	0.00	1.82	GP	E7YFP005
		2ND	4.56786	333916.95	4692474.65	0.00	0.00	1.82	GP	E7YFP005
		3RD	3.66195	333914.38	4692471.58	0.00	0.00	1.82	GP	E7YFP005
		4TH	3.62201	333862.19	4692429.60	0.00	0.00	1.82	GP	E7YFP005
		5TH	3.49322	333858.33	4692417.75	0.00	0.00	1.82	GP	E7YFP005
		6TH	3.48892	333895.10	4692460.60	0.00	0.00	1.82	GP	E7YFP005
		7TH	3.48337	333859.86	4692419.03	0.00	0.00	1.82	GP	E7YFP005
		8TH	3.47759	333860.46	4692428.60	0.00	0.00	1.82	GP	E7YFP005
		9TH	3.44951	333865.66	4692465.60	0.00	0.00	1.82	GP	E7YFP005
		10TH	3.37804	333856.80	4692416.46	0.00	0.00	1.82	GP	E7YFP005

Summary of Total Messages

#	Message Type
0	Fatal Error Message(s)
4	Warning Message(s)
29	Informational Message(s)
8760	Hours Were Processed
0	Calm Hours Identified
29	Missing Hours Identified (0.33 Percent)

Background Concentrations

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Summary of Background Concentrations

Carbon Monoxide (CO) Background Concentrations

19 Von Hillern, Boston MA

Time Period	Background Concentration* (ppm)	Background Concentration* (Micrograms/meter3)	NAAQS Standard ug/m3 (ppm)
1-Hour	1.9	2201.3	40,000 (35)
8-Hour	1.1	1281.2	10,000 (9)
Calculated Persistance Factor	0.58		

* Highest value of 2014, 2015 and 2016

Particulate Matter (PM2.5) Background Concentrations

174 North St, Boston MA

Time Period	Background Concentration* (ppm)	Background Concentration* (Micrograms/meter3)	NAAQS Standard ug/m3
24-Hour	-	15.4	35.0
Annual	-	7.1	15.0

* Average value of 2014, 2015 and 2016

Adjustment from 1-hour (DEP Standards, not project-specific)

Annual	24-Hour	8-Hour	3-Hour
0.08	0.40	0.70	0.90

Carbon Monoxide (CO) Background Concentrations

Year	1-Hour* (ppm)	8-Hour** (ppm)
2014	1.9	0.9
2015	1.8	1.1
2016	1.4	1.0

*** 1-Hour values represent 2nd highest**
**** 8-Hour values represent 2nd highest**

1- Hour Background Calculation

19 Von Hillern, Boston MA

Pollutant	1-Hour* (ppm)	Molecular weight	Background Concentration (Micrograms/meter3)
Carbon Monoxide	1.9	28.0	2201.3

* Highest value of 2014, 2015 and 2016

8-Hour Background Calculation

19 Von Hillern, Boston MA

Pollutant	8-Hour* (ppm)	Molecular weight	Background Concentration (Micrograms/meter3)
Carbon Monoxide	1.1	28.0	1281.2

* Highest value of 2014, 2015 and 2016

Particulate Matter ($PM_{2.5}$) Background Concentrations

Data from Massachusetts Air Quality Reports, MassDEP

Year	Arithmetic Mean* (Micrograms/meter3)	24-Hour** (Micrograms/meter3)
2014	7.0	14.5
2015	7.4	16.7
2016	7.0	14.9

* Values represent annual arithmetic mean

** 24-Hour values represent 98th percentile

Annual Background Calculation

174 North St, Boston MA

Pollutant	Arithmetic Mean* (Micrograms/meter3)	Molecular Weight	Background Concentration (Micrograms/meter3)
PM2.5	7.1	---	7.1

* Average value of 2014, 2015 and 2016

24-Hour Background Calculation

174 North St, Boston MA

Pollutant	24-Hour* (Micrograms/meter3)	Molecular Weight	Background Concentration (Micrograms/meter3)
PM2.5	15.4	---	15.4

* Average 98th percentile value of 2014, 2015 and 2016

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Emission Assessment

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	Design Concentrations					
	CO				PM 2.5 (Max)	
	1-HR	8-HR	1-HR	8-HR	24-HR	Annual
Year	ug/m^3	ug/m^3	ppm	ppm	ug/m^3	ug/m^3
2013	1299.55	577.51	1.12	0.50	3.51	1.56
2014	1383.95	503.36	1.19	0.43	4.08	1.50
2015	1359.38	518.59	1.17	0.45	4.18	1.59
2016	1341.16	597.80	1.15	0.51	4.17	1.53
2017	1283.06	507.91	1.10	0.44	4.86	1.53

Background Concentration					
CO				PM 2.5	
1-HR	8-HR	1-HR	8-HR	24-HR	Annual
ug/m^3	ug/m^3	ppm	ppm	ug/m^3	ug/m^3
2201.33	1281.20	1.89	1.10	15.37	7.14

	Total Concentrations					
	CO				PM 2.5 (Max)	
	1-HR	8-HR	1-HR	8-HR	24-HR	Annual
Year	ug/m^3	ug/m^3	ppm	ppm	ug/m^3	ug/m^3
2013	3500.88	1858.70	3.01	1.60	18.88	8.70
2014	3585.28	1784.56	3.08	1.53	19.44	8.64
2015	3560.71	1799.79	3.06	1.55	19.55	8.73
2016	3542.49	1879.00	3.04	1.61	19.54	8.67
2017	3484.39	1789.11	2.99	1.54	20.23	8.67

Max Concentration					
CO				PM 2.5	
ug/m^3	ug/m^3	ppm	ppm	ug/m^3	ug/m^3
1 HR Max	8 HR Max	1 HR Max	8 HR Max	24 HR Max	Annual Max
3585.28	1879.00	3.08	1.61	20.23	8.73

NAAQS					
CO				PM 2.5	
ug/m^3	ug/m^3	ppm	ppm	ug/m^3	ug/m^3
1-HR	8-HR	1-HR	8-HR	24-HR	Annual
40000	10000	9	35	35	12

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Appendix D

Comment Letters on Draft Environmental Assessment

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John Vitagliano
19 Seymour Street
Winthrop, MA 02152
Seagullconsult@msn.com

November 26, 2018

Richard Doucette
Environmental Program Manager
Federal Aviation Administration
1200 District Avenue
Burlington, MA 01803

Subject: Environmental Assessment, Logan International Airport-Terminal C Canopy, Connector and Roadway Project/Massport

Dear Mr. Doucette:

I am a lifelong resident of Winthrop and East Boston, residing near Logan International Airport. I am also a semi-regular Logan passenger with familiarity of the airport's airside and groundside facilities. I fully support the three projects included in the Environmental Assessment (EA)-the Terminal C Canopy, Connector and Roadway-as being required for the reasons stated in the EA.

I have experienced firsthand the excessive passenger congestion associated with Terminal C's existing security system which is often unable to adequately cope with current levels of passenger traffic and predictably will degrade as Logan's passenger volumes increase.

I have also experienced the significant deficiencies of the current Terminal C canopy and curbside facilities, in particular their shortcomings in providing adequate inclement weather protection to passengers waiting for the various ground transportation modes serving the terminal. The existing canopy's role as a transition from airside travel to environmentally preferable high occupancy vehicle (HOV) groundside connectivity is significantly limited by not only the current canopy/curbside design but also the severely deficient Terminal B to Terminal C roadway connections which restrict HOV access to the critical Terminal C curbside.

There isn't any aspect of the Terminal C Canopy, Connector and Roadway EA that would adversely affect the environment of Logan Airport's neighboring communities. In fact the potential reduction of existing roadway traffic congestion would improve airport air quality.

Sincerely,
John Vitagliano

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Dalzell, Stewart

From: Dalzell, Stewart
Sent: Tuesday, November 27, 2018 2:47 PM
To: 'richard.doucette@faa.gov'
Subject: Logan Terminal C Canopy, Connector, and Roadway Project EA - NHESP Comment

Richard – I received this note yesterday from NHESP regarding the Logan/Terminal C EA project:

The Division received a copy of the Draft EA for the proposed Terminal C Canopy, Connector, and Roadway Project at Boston Logan International Airport. Based on the information presented in the submitted materials it appears that all proposed activities, inclusive of staging and access, are located outside of Priority Habitat of State-listed species. Thus, I do not anticipate providing a formal NEPA comment letter on the Draft EA.

If the need arises for formal comments or I've misunderstood the proposed activities, please do not hesitate to call or email.

Sincerely,
Amy Hoenig
Endangered Species Review Biologist
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
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Stewart Dalzell, Deputy Director
Environmental Planning & Permitting
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617-568-3524 (Office)
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